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**RAZORBACKS, TICKY COWS, AND THE CLOSING OF THE GEORGIA OPEN RANGE:
THE DYNAMICS OF INSTITUTIONAL CHANGE UNCOVERED**

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ABSTRACT

While a redistribution of property rights might enable society to capture potential efficiency gains, the inevitable distributional conflicts make the transformation far from automatic. As individuals who would be adversely affected by the change seek a priori contracts for compensation, those who anticipate net benefits must decide how much to pay, who should pay, and who should receive their payments. As free riding, strategic bargaining, or the expensive monitoring and enforcement of contracts ultimately block voluntary agreements, society becomes unable to adopt the new institutional structure that promised to increase social wealth. If distributional conflicts become so severe and threaten to prevent the implementation of an income-enhancing property rights arrangement, what type of mechanisms will evolve to work these conflicts out? When voluntary negotiations break down, the government is usually called in to implement publically what individuals could not accomplish in the private sector. How, therefore, does the political process influence the path of institutional and economic development? This paper explores the dynamics of institutional change in an attempt to explain better why the adoption of potentially productive institutions are delayed and why inefficient ones persist.

The paper provides a micro-analysis of the transformation from an open range to a closed range policy in postbellum Georgia. The traditional agricultural practice in Georgia from colonial times until after the Civil War allowed animals to roam the countryside freely and forced farmers to erect fences around their growing crops. All unfenced land, therefore, was considered common pasture that could be used by anyone. After the Civil War there was a concerted effort to eradicate the open range policy and to force all livestock owners to fence in their animals instead of forcing farmers to fence them out of the growing crops. According to estimates provided in the paper, switching to the closed range would have generated net benefits for specific regions for Georgia, but distributional conflicts, coupled with high transaction costs, made a voluntary agreement to close the range unattainable.

The empirical evidence shows that the Georgia legislature's role in facilitating the closing of the range was crucial. First, the legislature allowed countywide referenda on what became known as the fence question. Upon seeing that majority rule generally failed as a mechanism to facilitate the adoption of a relatively profitable institution, the legislative body manipulated the voting mechanism so as to guarantee compensation for a subset of the expected losers. By forcing the transfer of income from expected winners to expected losers, the state legislature was able to facilitate the adoption of the closed range policy that promoted more rapid agricultural development in postbellum Georgia.

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Social scientists would agree that attempts to modify economic, political, or social institutions represent the "rational" efforts of individuals searching for economic progress. What forces drive individuals or groups to seek alterations in their institutional environment is a debate that has yet to be settled. "Radical" historians, for example, claim that change is always rooted in class conflict in which economic elites use their (political) power to impose institutions that enable them to extract the "labor surplus" more easily. This view sharply conflicts with many economists' notion that exogenous shocks, such as relative price changes or discoveries of new opportunities for gain, create an incentive for society, or a subset thereof, to adopt a different institutional regime that promises to promote economic development. While both approaches claim to identify the conditions necessary to set the process of institutional change into motion, neither theory explicitly models or seriously discusses the transition from status quo to terminus. Whether economic change stems from a motivation to capture potential efficiency gains or from the machinations of a dominant class bent on expropriating the labor surplus, it is remiss to ignore the *process* of such a change.

"New institutional economists" have emphasized the significant role that institutional change plays in determining economic prosperity, but, at the same time, they have paid little attention to the nuances that surround the transformation. Claiming that "the emergence of new property rights takes place in response to the desires of the interacting persons for adjustments to new benefit-cost possibilities"¹ does not explain how the change is ultimately realized. As if operating within a market system, individuals, Coase asserts, will realize potential efficiency gains and adopt the new, more efficient institutional regime that, presumably, will lead society toward economic expansion.² As Douglass North asserts: "Competition in the face of ubiquitous scarcity dictates that the more efficient institution, policy, or individual action will survive and the inefficient ones perish."³ The process of change, however, is portrayed as a "black box." We know that within the box there is a labyrinth that might impede the way of efficient institutional change and economic growth, but this subtlety has been relegated to a position of secondary importance in the study of institutional change.

When an income-enhancing institutional change has been obstructed, economists often blame transaction costs for blocking the movement. Realizing that a new institution would be more valuable than the old one is quite different from actually adopting the better regime. As individuals who would be adversely affected by the change seek a priori contracts for compensation, those who anticipate net benefits must decide how much to pay, who should pay, and who should receive their payments. If distributional conflicts must be resolved in the private sector, problems such as free riding, strategic bargaining, or expensive monitoring and enforcement of contracts can block

voluntary agreements and prohibit society from adopting a new institutional structure that promised to increase social wealth.⁴ Often, at the behest of the benefitting group, the government is called in to implement the new, income-generating institutional arrangement. But as the political power of the competing groups differs, nothing guarantees that the political solution adopted will be the one that captures the entire expected efficiency gain or that resolves the distributional conflicts that ultimately prevented a voluntary, free market solution.⁵ Therefore, in studying the dynamics of institutional change, it is important to address the question of how the government influences the process of institutional and economic development. Moreover, how does the political solution differ from the one that would have emerged from a market environment where transaction costs were negligible?

In an attempt to tackle these questions, this paper focuses on the changing of a property rights institution that was actively debated throughout the postbellum South – the closing of the open range. In particular, the paper concentrates on the closing of the Georgia range from 1872 through 1890. The traditional agricultural practice in Georgia was to allow animals to roam the countryside freely and to force farmers to erect fences around their growing crops. In other words, all unfenced land was common pasture that could be used by anyone. After the Civil War, however, there was a concerted effort to eradicate the open range policy and to enforce strict property rights to all land — fenced or unfenced, improved or unimproved.

Georgia is a particularly interesting state to focus upon because it was extremely diverse geographically. As the state varied from the Appalachian mountains in the northern section to the fertile argillaceous loam of the middle section to the expansive tracts of pine trees and wiregrass in the southeast, differing economic interests developed concerning the closing of the range.⁶ Map 1 shows the state broken down into six traditional regions.⁷ Counties in the Plantation and Upcountry regions, along with many counties in the Mountain region, were best suited for agricultural production, as the soil and climate made cotton production, in particular, profitable. In these highly improved counties, improved acreage ranged from as low as twenty-two percent to as high as fifty-eight percent of the total land mass. Conversely, the average share of improved acreage in the Wiregrass, Pine Barrens, and Coastal regions amounted to only about twelve percent.

According to estimates presented in the paper, the closed range would have generated net benefits for many counties in the state, especially in the Plantation Belt and Upcountry, but most of these counties maintained the status quo. While the net benefits may have been positive, the transaction costs and distributional conflicts associated with voluntarily redefining access rights to unfenced land were prohibitive. Empirical evidence shows that the Georgia legislature's role in facilitating the institutional change was crucial. The Georgia legislature allowed county and, later, sub-county referenda on the fence question that reduced the transaction costs that prevented a voluntary agreement to dispense with the open range. Most importantly, the legislature promised to enforce sidepayments between expected winners and losers once the new law was adopted at the local level. The voting returns of the county and sub-county referenda show that voters cast their ballots for the option (the closed range or the status quo) that would maximize their expected net benefits. Furthermore, when compensation for a subset of the expected losers was guaranteed by the legislature, the data show that these voters responded as might be expected — they switched their votes from the status quo to the new institution. Although society was unable to achieve a Pareto superior solution to the fence problem in postbellum Georgia, this paper demonstrates the important

function that the Georgia legislature played in facilitating the closing of the range which, in turn, led to more rapid agricultural development in postbellum Georgia.

The Georgia Open Range and the Call for Reform

From colonial times until after the Civil War, Georgia law permitted citizens to allow their animals to graze on any land that was unfenced. As English emigrants arrived in America to find sparse population density and large tracts of unimproved land between farms, they found it desirable and economical to allow their animals to roam the countryside freely. It should be noted, however, that English common law did not require a man to fence his land against the intrusion of his neighbors' beasts. Rather, English common law viewed an individual's property as private and, thus, if a man's animals strayed onto the enclosed or unenclosed land of his neighbor, the animals were to be considered trespassers.⁸ If a trespassing animal were destroying a farmer's crops, common law permitted him to impound or even kill the intruding animal, if necessary. Moreover, if the trespassing animal happened to damage any of the farmer's crops, under common law the farmer was permitted to sue the animal's owner for damages.⁹ Upon arriving in America, however, colonists found the laws of their homeland too restrictive. Not only was it difficult and expensive to provide their animals with the proper pasturage, but it was impossible to watch them constantly as they foraged through nearby forests. The problems associated with allowing animals to rove the terrain freely were quickly realized — it was impossible to prevent livestock from trampling and eating the growing crops. The decision, therefore, was to require farmers to fence *in* their crops. Put another way, laws were created that forced farmers to fence *out* the animals.¹⁰

In 1655, for example, the Newbury, Massachusetts town council "ordered that all fences . . . be made so sufficient as to keep out all manner of swine and other cattle, great or small, and at whose fence or part of fence any swine or other cattle shall break through, the party owning the fence shall not only bear and suffer all damages, but shall further pay for each rod so insufficient, the sum of two shillings."¹¹ But Newbury was not the only community to force farmers to erect and to maintain "lawful" fences around their crops, or else forgo any chance for compensation for damages caused by another's marauding animals. In fact, "in every state of the Union, from the earliest times, it ha[d] been made compulsory for landowners to maintain good fences for the protection of crops; to fence animals *out*, rather than to fence them *in*."¹² Georgia's first fence law, passed in 1759, explicitly required that:

all fences or enclosures . . . that shall be made around or about any garden, orchard, rice ground, indigo field, plantation or settlement in this province, shall be six feet high from the ground when staked or ridged and from the ground to the height of three feet of every such fence or enclosure, the rails thereof shall not be more than four inches distant from each other; and that all fences or enclosures that shall consist of paling shall likewise be six feet from the ground and the pales thereof not more than two inches asunder: *Provided always*, that where any fence or enclosure shall be made with a ditch or trench, the same shall be four feet wide, and in that case the fence shall be six feet high from the bottom of the ditch.¹³

Those whose fences did not adhere precisely to the letter of the fence law were subject to treble damages if they killed or injured an animal straying upon ill-fenced land. In the 1881 decision of *Hamilton v. Howard*, the Georgia Supreme Court declared that a lawful fence had to rise five feet from the ground everywhere, rather than merely averaging that height.¹⁴ Furthermore, an 1889 decision ruled that an agreement to dispense with a partition fence (one between two neighbors) was not the equivalent of a legal fence. Unless an actual fence were broken — not merely a contract or agreement to dispense with a fence or an agreement to treat a dividing line as a fence — it was illegal for a farmer to harm a stray.¹⁵ The Court's message throughout was clear: a legal fence was defined absolutely and no room for variations and exceptions existed.

Whereas the open range seemed to have been an economical response to the antebellum demography and geography of America, the late antebellum and postbellum eras brought a new attitude toward the profitability of fencing out animals and fencing in crops. "Excessive Fencing is peculiarly an American abuse, which urgently cries for reform," clamored Horace Greeley, who was certainly not alone in blasting the fence law as "needless and indefensible."¹⁶ Farmers — southern farmers in particular — were told to ask themselves: "Are we an agricultural or stockraising people . . . ?"¹⁷ As the editor of the Jackson county (Georgia) newspaper succinctly noted: "it is sad evidence of old fogysim, general ignorance and backwardness of agriculture in the South that such a law as that now in force can exist."¹⁸ Given the destruction caused by the Civil War, agricultural "progressives" argued that it was time for innovation. It was time to rethink age-old policies that no longer encouraged maximum agricultural efficiency. With confidence, reformers claimed that a "stock law," or the fencing in of animals instead of crops, would be the first step toward bringing southern farmers out of relative poverty and toward agricultural prosperity.¹⁹

What would cause people to seek a change in the open range policy that was accepted practice for well over a century? Harold Demsetz, for example, argues that "property rights develop to internalize externalities when the gains of internalization become larger than the cost of internalization."²⁰ Similarly, Lance Davis and Douglass North theorize that institutional change tends to come about when the net present value of a new regime of property rights exceeds that of the traditional set of rights.²¹ As an economy progresses through time, the costs and benefits of each feasible institutional arrangement continuously change, causing individuals and groups constantly to update their decisions concerning the appropriate arrangement for society. As late nineteenth century farmers in the South, in particular, witnessed the tangible and increasing loss of land, labor, and capital caused by the fence requirement, many began to argue that the traditional practice of allowing animals to forage freely was no longer compatible with maximum agricultural efficiency. Reformers believed that conditions had sufficiently changed to make it economical for farmers to fence in their own livestock, instead of forcing their neighbors to fence them out. When "the subject [was] . . . reduced to dollars and cents," fence reformers were convinced that agricultural prosperity — in fact, overall economic growth — depended on their innovation.²²

The open range, reformers argued, was an anachronism. They acknowledged that allowing animals to roam at will was once a tenable policy when farms were far between and population density was low. But as economic and demographic changes were developing in the postbellum period, many believed that the traditional fence law had outlived its purpose. As population expanded throughout the South, as blacks took advantage of their freedom to move, and as the

growth of the railroad network made it possible to market crops from previously isolated areas, the population density in many regions began to swell. Increased population density simultaneously increased the proportion of land under till and increased the number of animals freely roaming the countryside. Together, these effects of population growth increased the probability that one person's roving animals would destroy another's crops. Certainly, a farmer could sue if an animal destroyed his crops, but he had to have evidence of the trespass and it was also impossible for him to watch his fields constantly. Therefore, holding everything else constant, increased population density led to an increase in the relative costs of maintaining the open range policy and made fencing animals a more attractive option.

The expansion of the railroad network in Georgia also increased the relative benefits associated with fence reform. Since railroad right of ways were not required to be fenced under Georgia law, trains often hit wandering animals. As railroad tracks increasingly began to lace the South and as demographic changes created a larger supply of animals roaming the countryside, the result was not surprising — many animals were destroyed, railroad cars were damaged, and passengers were injured. Throughout the late nineteenth century the Georgia Supreme Court was called upon to resolve the legal and economic problems created when livestock and train "contend for the same place at the same instant."²³ The Court decided that as long as the railroad could show that it exercised "ordinary and reasonable diligence" in its attempt to avoid killing a wandering animal, then it could escape liability. In any case, whether the railroad was guilty or not, the killing of animals and the physical damage done to trains and passengers was a cost of maintaining the open range that grew over time.

Figure 1 plots the time series of the length of railroad track in Georgia from 1860 to 1889, inclusive. After a seventy-three percent increase from the end of the Civil War to 1880, railroad coverage in Georgia expanded rapidly in the 1880s. That decade experienced another seventy-three percent increase in track mileage, from 2,459 miles in 1880 to 4,268 miles in 1889. The contemporary annual reports of railroad companies give some idea of the magnitude of the benefits that the railroad industry could have captured if the closed range had been instituted in 1880. A sample of six annual reports in the postbellum period from three companies suggests that railroads were forced to pay, on average, approximately \$19.90 (in 1880 dollars) per track mile for livestock that was killed because of the railroad's negligence.²⁴ According to these data, if the closed range policy were instituted throughout Georgia in 1880, the railroad industry would have realized a net benefit of approximately one million dollars.²⁵ Note that this figure does not consider the dollar amount spent on repairing damage to trains that hit livestock, the monetary value of medical attention given to injured passengers, and lawyers' fees. In addition, it does not include the value of livestock killed in situations when the railroad was not deemed negligent. The expansion of the railroad in the latter part of the nineteenth century certainly raised the cost of keeping the open range relative to the closed range.

When railroads arrived in areas previously without a connection, the opportunity cost associated with the fence law intensified, making the closed range more profitable, all else constant. Relatively inexpensive transportation enabled farmers to import fertilizers that tremendously increased cotton yields per acre. Moreover, the railroad provided a relatively efficient and inexpensive method for sending the fertilizer-stimulated surplus to major marketing centers.²⁶ In

many areas of Georgia, the expansion of the population and of the railroad network, together, created a new problem for farmers — how to use the available productive land more efficiently. With animals fenced in, advocates of reform predicted that improved acreage could be expanded.

Supporters of the policy change saw two sources of unimproved land that could be brought into cultivation so as to expand production — the wasted land used as fence rows and the patches of fertile ground too small to justify the expenditure for a lawful fence. Contemporaries believed that the largest potential efficiency gain from the stock law would be captured by breaking down the fences that surrounded their crops and by bringing into cultivation that land that was being used as fence rows and the small fertile patches not currently under till. In addition, farmers expected to save resources and time when expensive annual fence repairs could be eradicated.²⁷ Nineteenth century southern farmers, for the most part, used "worm" fences to enclose their crops, and used pale fences for their gardens and homes. Because the worm fence is constructed by laying the ends of the rails on top of one another in a zigzag fashion, a length of seven to eight feet of productive land was wasted as a fence row.²⁸ Stock law champions spoke of the fence requirement as an additional tax upon their land, and a regressive one at that. Assume that worm fences spanned seven feet and that crops were grown in perfectly square plots of land. Then, since the average amount of tilled acreage on Georgia farms was 55.3 ($\sigma = 24.2$), it is reasonable to argue that, at a minimum, between 1.5 and 2.4 percent, or 115,354 to 184,567 acres, of the productive land in Georgia was wasted in the form of fence rows.²⁹ Of course, this estimate does not represent all of the productive land that could be brought into cultivation if the closed range policy were enacted. The calculation ignores all of the small fertile patches of land that were not profitable enough to justify a fence expenditure. Certainly there were benefits associated with enclosing animals, but the important question from a social income maximization point of view was: would the benefits of fence reform have exceeded the costs of changing to a closed range policy?

The Profitability of Reform

Using the data in the 1880 Agricultural Census, it is possible to provide an approximation of the expected profit or loss that each county in Georgia would have realized if the stock law had been instantaneously implemented in 1880. (Specific details of the calculation are given in Appendix A, but outlined below.) This theoretical calculation implicitly assumes that farmers immediately adjusted to the incentives created by the new law.

I begin by assuming hypothetically that the stock law was instituted instantaneously throughout Georgia. In other words, all animals would be enclosed, enabling farmers to remove the fences surrounding their crops of cotton and grains. For the calculation, I choose the low estimate of wasted acreage of 1.5 percent. For simplicity, I assume that farmers grew two crops with their new-found land; cotton would be grown on the previously wasted fence rows of the cotton crops, while the wasted land from the corn, wheat, rye, and oat fields is assumed to have been planted in corn, peas, and fodder.³⁰ Animals in this agricultural society pose somewhat of a problem for the calculation because some were already kept in pastures, while others were roaming the open range. Therefore, after assigning livestock to available pasturage that existed before the hypothetical institutional change, a feed allowance is made for those animals that presumably were previously

unenclosed and would afterwards be put behind fences. Since some animal owners were probably overinvesting in livestock under the open range policy and the calculation considers all of the animals reported by the Census, too much grain will be allocated to feeding the previously non-pastured animals.³¹ This will bias the profitability estimate downward, and therefore only strengthens the final result. Of course, a subtraction is made for the cost of producing the crops, including the rent associated with the land used and capital needed to produce the extra crops. Finally, the net profit from growing the extra cotton, corn, peas, and fodder is the total value of the crops produced, minus the cost of feeding the previously non-pastured animals, minus the cost of producing the crops.

In many parts of the state, farmers also would have saved time and resources as fewer fences would need to be maintained under a closed range situation. The assumption I make is that after the closed range were enacted, farmers would have put their animals into pastures and supplemented their diets with other grains. Under this assumption, the average farmer would have found fencing a pasture for several animals much cheaper than fencing in his fifty-five acre farm. In regions such as the Wiregrass or Pine Barrens where animal husbandry took precedence over farming, "ranchers" may have found it more profitable to fence large sections of unimproved land (similar to the Western ranges) and to allow the animals to feed themselves in these large open pastures. If this were the case, then the estimated net benefits of the policy change for these particular regions will be biased downward. Since it is my goal to use assumptions that bias the profitability estimate against being positive, I will maintain the assumption that after the institutional change, all Georgia farmers pastured their animals and supplemented their diets with grain.

In order to approximate the savings from maintaining fewer fences, I estimate the value of the difference in the depreciation of crop fences before the stock law and of the fences needed to enclose the previously non-pastured animals after the stock law. (Note that in largely unimproved counties with many animals, a closed range probably required more fencing than was previously needed for the protection of the small amount of tilled acreage.) Also taken into account in the calculation is the fact that farmers would bear an additional one-time cost of building fences around the newly created pasture. Conceivably, they could have moved the fences from around their crops to another location and used the old wood to build fences around pastures. However, I assume that farmers had to build their animals' fences at the maximum cost of building a new one, \$1.90 per acre. Again, this assumption will bias the results against finding net benefits. Thus, the final profitability measure amounts to the net profit earned from the various crops grown on the new land brought into cultivation, plus the depreciation amount saved by maintaining fewer fences, minus the cost of building fences for animals previously unenclosed.

The results of the calculation are presented in Table 1 and represent the net present value of the social (un)profitability of the stock law using 1880 data and a discount rate of seven percent. The results are broken down to show the weighted average and per capita (dis)savings for the six conventional regions of Georgia. The profit measure is also shown as a percentage of the total value of farm produce grown within the region in 1880. In order to test the robustness of the estimates, I varied several of the key assumptions of the calculation and recomputed the net profitability. The results of these sensitivity tests, reported in Table 3.A1, confirm that the estimates reported in Table 1 tend to be robust to specification changes. Finally, the results in the Table should be viewed as

minimum values. In other words, the net present value calculation does not allow farmers to adjust their amount of improved acreage, their crop mix, or the size of their livestock herds over time. Those regions expecting to receive a loss from the stock law would adjust quickly to the law and certainly would not have realized the full effect of the loss as reported in the Table. Similarly, those areas with a positive expected value would actually have had larger "real" savings.

The results in Table 1 tend to substantiate a priori expectations. The regions with large tracts of unimproved land that were used as natural pasture would have been hurt by the imposition of the stock law, while areas with relatively more improved acreage would have benefitted. As shown in the Table, the unimproved Wiregrass, Pine Barrens, Coastal, and, to a lesser extent, Mountain regions expected to lose if property rights to all land were strictly enforced. While the average loss for a Pine Barrens, Wiregrass, or Coastal county would have been between \$82,000 and \$101,000, in relative terms, this loss would have represented approximately thirty to forty percent of the value of produce grown in the county in 1880. The average Mountain county expected a loss from the closed range of nearly \$13,000, or seven percent of the value of its agricultural production. The greatest benefits would have accrued to the most improved counties which made up the Plantation Belt and Upcountry regions. As Table 1 shows, an average county in the Upcountry could have captured about \$109,000 in net benefits from the closed range, while Plantation Belt counties expected average net benefits on the order of \$167,000. For Upcountry and Plantation Belt counties, the expected net benefits, in relative terms, were sixteen percent and twenty-one percent of the value of agricultural production, respectively. For the state as a whole it is interesting to note that the expected savings was, on average, \$69,474 per county. The net sum of the profits across all counties in the state would have amounted to \$8,007,500. If we include the expected savings from the railroad industry, this eight million dollar savings would have risen by another one million dollars, as pointed out above.

An encouraging result of the profitability calculation presented in Table 1 is the average expected savings for those counties that actually had passed the stock law by 1882.³² This group of counties, on average, expected to receive about \$122,000 more than the state mean. This observation lends credence to the Davis and North hypothesis that institutional change tends to come about when the net present value of a new institutional arrangement exceeds that of the status quo. However, net profitability was not a sufficient condition for the change to take place. Table 2 shows the distribution of expected profits and losses broken down by region, with counties that adopted the law by 1882 denoted by a star (or dagger, see Table). In the Plantation Belt there were nine counties with an expected gain greater than \$100,000 that had implemented the stock law, but thirty counties with the same magnitude of savings had not yet adopted the law. And in the Upcountry, fifteen counties with a profit estimate greater than \$100,000 did not follow the lead of two others that had adopted the law, but had an expected gain of less than \$100,000.³³ Why did these forty-five counties, and those in the same position in the Mountain region, not adopt the relatively profitable law? Attributing the failure to transaction costs alone is much too simple, for there is no reason to believe that transaction costs were lower in the counties that adopted the stock law than in those that did not. In order to find the reason that most of the counties that expected a net gain from the stock law failed to adopt it in the early 1880s, it is necessary to explore the rules that governed institutional choice.

Beginning in 1872 and continuing throughout the late nineteenth century, the Georgia legislature manipulated the voting mechanism that determined how the stock law could be implemented in the state. Given the nature of the rule changes that narrowed the fence issue to smaller and smaller geographic regions, it is important to concentrate on very specific politico-geographic areas. Because the data requirements of this endeavor tend to be quite extensive, I focus my attention on the two Upcountry counties that have received the most attention in the historical literature — Carroll and Jackson counties. As the data in Table 1 and 2 show, Carroll's expected savings was near the top of the distribution for the Upcountry, while Jackson's expected savings was clearly greater than almost all counties in the Upcountry.³⁴ In terms of net profitability relative to the state as a whole, Carroll ranked in the seventh decile, while Jackson ranked in the top of the ninth.

The analysis of the fence law transformation in Carroll and Jackson is not meant to serve as a general model for or statement on the state or the South as a whole. Each geographic region throughout Georgia, and consequently the South, was unique — with different ratios of improved acreage and cotton production, different numbers and kinds of livestock, and diverse racial compositions.³⁵ Carroll and Jackson counties, however, offer a rigorous test of the theory that institutional change tends to come about as the relative benefits become positive. Although the expected gains were high for these counties, contrary to the theory, they did not adopt the new institution right away. What is presented in the remainder of the paper is a microscopic look at the dynamics of institutional change. If distributional conflicts and excessive transaction costs prohibit society from adopting an income-enhancing institutional change, historically then, how have these difficulties been overcome? For the case of two upcountry Georgia counties, this paper emphasizes the crucial role that the political process plays as a mechanism to facilitate institutional and economic development.

Mechanism Design and Stock Law Implementation

When animals were free to roam the open range and there was no legal way to force animal owners to enclose their livestock, what prevented citizens from voluntarily internalizing the externality, as Coase suggests? Since animal owners had a legal right to allow their animals to roam the countryside, advocates of the stock law could have compensated, or bribed, their neighbors to fence in their stock. In theory, however, this type of negotiated settlement would very rarely occur and, if it did, would probably be quite unstable.

First, it would be difficult for individuals to determine precisely the dollar amount that others expected to gain or lose if the closed range policy were enacted. Furthermore, it is clear that each person would have an incentive to misrepresent his true expected value — losers would overreport their expected losses and winners would underreport their anticipated gains. In order for the negotiated "stock law" to operate properly and before anyone growing crops decided to take down his fences, all animal owners would have to agree to forgo their common right to the open range and to enclose their animals. In this case, each animal owner became a monopolist who could hold out until he captured the entire net expected social gain for himself. Certainly, the costs associated with achieving the unanimous consent of all residents of a county or a smaller

geographical district would skyrocket, quickly becoming greater than any of the benefits that would have been realized under the new institution.³⁶

Even if, say, a small group of farmers were able to negotiate a contract restricting each other from using the open range, the stability of such an agreement is questionable. The Georgia Supreme Court did recognize these Coase type agreements between neighbors. In *Winters v. Jacobs* the Court affirmed that "If adjacent owners agree to dispense with the partition fence and to inclose their land in common, it is the same as if they are jointly bound to maintain a division fence. The agreement is the fence, and each of the parties is bound at his peril to keep his cattle on his own land."³⁷ These gentlemanly accords, however, could easily sour if one party became lax in his commitment to abide by the contract's terms. The bitter dispute between neighbors George H. Tumlin and Charles C. Parrott of Bartow county became the source of the Georgia high court's deliberations. Allegedly, Tumlin "wilfully, recklessly and unnecessarily [shot] and kill[ed] three [of Parrott's] cattle" with a Winchester rifle. Witnesses at Tumlin's trial testified that the two neighbors "had made an agreement not to have any dividing fence as they were scarce of timber, and that neither one of them was to pasture their lands adjoining each other." And there was no dispute that the surrounding fence for the two plantations was legal.³⁸

The problem arose when Parrott's cattle strayed onto Tumlin's land, eating the latter's crops. Tumlin frequently had to drive the cattle back over to their home, requesting Parrott and his workers to keep the animals off his – Tumlin's – property. Soon, the cattle were back eating Tumlin's crops, so he shot the animals, killing \$240 worth of livestock and maiming another \$30 worth. Tumlin did not recompense his neighbor. Parrott sued for treble damages, as allowed by law, arguing that his neighbor did not try to drive the cattle back home and that Tumlin's land was not enclosed by a legal fence.³⁹ In the end, Tumlin lost his case. The Court decided that in order to kill animals without responsibility, an actual legal fence had to be broken, not merely the agreement to dispense with it.⁴⁰

Of course, there probably were harmonious agreements between two, and possibly more, neighbors that enabled them to capture some of the efficiency gains associated with enclosing livestock. However, as George Tumlin learned, even neighbors could not be completely trusted to abide by a simple agreement to remove a dividing fence and to keep animals under control. The last resort for men in Tumlin's position certainly was not to kill the trespassing animals, it was to enclose their improved acreage — in total. Robert Frost was indeed correct — "'good fences make good neighbors.'"⁴¹ The seriousness of the fence law, reinforced by decisions of the Georgia Supreme Court, forced farmers to think twice about growing crops without the protection of a tangible fence, on all sides.

In 1872 the Georgia General Assembly eased the burden of fence law reformers by allowing individual counties to decide whether to fence crops or livestock. Whereas before 1872 a single animal owner anywhere in Georgia could, theoretically at least, force every farmer to erect fences to keep his animals out, after 1872 it took a majority of voters who turned out at an election within a county to do so. To bring about a fence election, fifty freeholders were required to file a petition with the county's ordinary (county chief executive), whose job it was to advertise their desire for an election. The movement could be quashed, however, if fifty additional freeholders presented the ordinary with a counter-petition to call off the impending election. If, after the filing of the counter-petition, twenty-five more landowners added their names to the original petition, the

ordinary was forced to hold an election on the first Monday in July. The 1872 act decreed that a county could not have more than one fence election per two year period.⁴² While only freeholders could call for or call off an election, the important feature of this legislation was that all eligible voters were permitted to vote in the referendum.⁴³

The 1872 legislation was a major victory for stock law supporters in Georgia. As Table 1 demonstrates, the costs and benefits were dramatically different across the state, making a statewide stock law politically unattainable. At their 1878 spring meeting in Americus, Georgia, "A Member" of the Georgia State Agricultural Society acknowledged that, ". . . there are some parts of Georgia where the [stock] law would work very well. Again, there are other parts of Georgia where, I am convinced, it [stock law] would work injuriously."⁴⁴ J.T. Henderson, the Commissioner of Agriculture, in his 1881 report confirmed that "It is not expected that the stock law will be adopted in the wire-grass counties of the State, where the larger area is in [open range] pasture. In that section of the State and in some of the counties of North Georgia the proposed law would be as great a hardship as the old law, requiring crops to be fenced, is in farming and planting sections."⁴⁵ Fence reformers realized that a statewide stock law, such as the one hypothetically assumed in the last section, would be difficult legislation to push through the General Assembly. Henderson concluded, "The interests and industries of different sections of the State are too varied to admit of a general law applicable to all sections."⁴⁶ The commissioner's predecessor, Thomas P. Janes, concurred, "This law [county option] is a wise one, and perhaps as much as can be reasonably demanded by the advocates of a *no fence* law. Georgia is a large state, and the circumstances differ greatly in the several sections of the State Any law on this subject, involving a material change in the system of fencing, should be submitted to a vote of the people of each county for adoption or rejection."⁴⁷ In Georgia at least, the fence's fate was to be determined by direct local democracy.⁴⁸

The act "relating to fences and stock, and for the protection of crops," as it was officially called, was quite resistant to change throughout the 1870s. The General Assembly, on the whole, agreed with the more moderate stock law supporters that enclosing animals was a necessary step toward agricultural prosperity. But the decision to fence or not had to be settled at the local level — the legislature was not *yet* prepared to preempt "a vote of the people." Efforts to repeal a county's right to change its fence laws were futile. An 1873 Senate bill to repeal the act relating to fences and stock was returned from the Committee on Agriculture with an adverse recommendation. Given that the committee was dominated (4–3) by Plantation Belt senators whose counties, according to the previously reported estimates for 1880, expected to profit from the stock law, it is not surprising that the bill was quashed in committee.⁴⁹ An 1875 attempt at repeal in the House faced the same fate.⁵⁰ While political sentiment throughout the 1870s leaned toward reform, implementation at the county level was far from spirited. By 1882 only 8.8 percent (12 of 137) of all Georgia counties had voluntarily adopted the stock law and two counties had the law imposed on them by the state legislature. Of those counties that expected a net benefit in 1880, only 15.9 percent (14 of 88) had the stock law by 1882, ten years after the legislature allowed a vote on the issue. The main question, however, is what prevented the other counties whose adoption would have been profitable from following the same course of action? A close examination of the data from Carroll and Jackson counties, which are both about forty miles upcountry of Atlanta, will reveal that while the stock law may have been income-enhancing from a social point of view, the median voter was against fence

reform. The ultimate reason for the stock law's defeat at the county level can be traced to the mechanism that governed institutional choice.

To see why the 1872 law, generally, was an inadequate mechanism for promoting the adoption of the closed range, it is best to identify how various coalitions sided on the fence debate. In order to distinguish the bases of support for the stock law, the natural way to divide the agricultural communities of Carroll and Jackson is into six coalitions – landowners (expected winners and losers from the stock law), tenants (winners and losers), wage laborers, and townspeople. With the 100 percent matched sample of the manuscript agricultural and population schedules of the 1880 census that I have compiled, I am able to determine precisely the sizes of the six coalitions defined above. In particular, since I have very detailed information on individual farms, I am able to perform the same calculation as detailed in Appendix A so as to determine which owner-operated or tenant farms expected a net loss or benefit if the closed range were instituted in 1880. The results of the calculation for Carroll and Jackson farms are presented in Tables 3 and 4. The tables show the sizes and average expected benefits or losses for the various farm coalitions, as well as summary statistics describing the farms in each coalition.

Before proceeding to an analysis of the results, it is important to discuss a problem that arises in the calculation of the net benefits for individual farms. When the individual expected benefits and losses are summed across all farms within a county, the sum turns out to be much less than the savings estimate obtained using the county's aggregated data, as reported in Table 1 — i.e., $f(\sum_{i=1}^N x_i) > \sum_{i=1}^N f_i(x_i)$, where x_i represents the vector of data for farm i and f is the expected savings function. The discrepancy arises because some farmers were already putting their animals in fenced pastures, even while the open range policy was still in force. According to my estimates which are based on contemporary agricultural practices (see Appendix A, section 5), most of these farmers provided their animals with more pasture than they actually needed. The "excess" pasture amounts to 3726 acres in Carroll and 3513 acres in Jackson. In the countywide calculations described above and presented in Table 1, the "excess" pasture is hypothetically consumed by others because it is as if a "social planner" allocated other farmers' animals to the extra pasture land. However, when I calculate the individual farmer's net benefit, I have to assume that the excess pasture is wasted because the user (if anyone) of the abundant land cannot be identified because of the data's limitations. If farmers, who had no pasture of their own, were renting the excess pasturage, then this might result in an overestimate of the number of expected losers and the value of their losses. Unfortunately, there is no way to infer rental patterns from the census data. Thus, the results reported in Tables 3 and 4 are based on the individual level data as reported in the census and I maintain the somewhat unrealistic assumption that the excess pasture is wasted.

What is immediately apparent from the results in Tables 3 and 4 is that the stock law would have been most profitable for those farmers already pasturing their animals before the hypothetical institutional change. Landowners in Carroll who expected a net gain used eight acres of pasture, while their losing counterparts had, on average, only one-tenth of an acre in pasture. A similar observation holds for Carroll's tenants. Tenants who would have profitted from the stock law received from their landlords about one and a half acres of pasture, while their counterparts expecting a loss were allocated virtually no pasture space. If farmers were already enclosing their

animals in pastures, then they were receiving no benefits from the open range. In fact, the fence law imposed a cost on these farmers by forcing them to fence in the tilled areas of their farms. If these farmers were legally permitted to take down their fences, they would have realized a savings in the form of expanded acreage and diminished annual fence repairs.

Even if a farmer had no pasture, he still might have been able to benefit from a closing of the range. If he were cultivating a piece of land and had very few animals, then it is quite plausible that the savings the farmer would have received from expanding his acreage and lowering his fencing costs would have exceed the costs of building a pasture for his few animals and feeding them homegrown or purchased grain. This point is made in the comparison of livestock holdings between expected winners and losers. Expected beneficiaries (comparing landowners and tenants separately) always have fewer animals, on average, than expected losers. Thus, there seem to be two important forces that determined a farmer's monetary interest in the closed range — whether he was already pasturing his livestock and the size of his herd.

Some historians of the fence debate in the postbellum South argue that coalitions split along very well-defined lines. Laborers and tenants of both races, along with "very small farmers, the poorer end of the landowning class," formed a coalition against reform, while richer white landowners pushed for fence reform.⁵¹ Or, as Steven Hahn puts it, "the mass of Upcountry yeomen, tenants, and laborers" fought against "landlords, merchants, and business interests throughout the state."⁵² However, if the data in Tables 3 and 4 offer some indication as to how individuals sided in the conflict, these historians' claims are somewhat clouded. On the surface, it seems likely that small, relatively poor landowners who relied on the open range to feed their animals would have been solidly against any redefinition of property rights to the unenclosed land around them. Conversely, wealthier landowners who could afford to provide pasturage for their animals and who expected to profit from enclosure were probably the champions of reform. However, as argued above, farm size alone did not determine how a farmer would fare if the laws governing unfenced land were changed. No doubt some small farmers had very few animals and stood to gain from enclosing livestock, while some very large landowners had little or no pasture lands along with a large herd size. It is interesting to note that of Carroll's 438 landowners (hypothetically) expecting a net gain from the closed range policy, 253 had less than 45 tilled acres, 178 of the 438 had less than 35 acres, and 82 had less than 25 acres. Similarly, of the 378 winning landowners in Jackson, 139 had less than 45 acres in production, 87 of 378 had less than 35 acres, and 40 had less than 25 acres. Moreover, there were many relatively large farms that stood to lose if the closed range were imposed. Of the 983 losing landowners in Carroll, 190 had over 60 acres under till, 136 had more than 70 acres, and 35 had more than 100 acres. Of the 751 landowners in Jackson predicted to lose, 86 had more than 100 acres in production. Thus, contrary to Hahn's claims, it is not clear that "very small farmers" or yeomen and relatively wealthy landowners (in terms of farm size) would have split so easily against or in favor of fence reform. The forces that determined a farmer's financial interest in the matter, as shown above, are more complicated than a simple "haves" versus "have nots" model would suggest.

Given the profitability estimates presented in Tables 3 and 4, tenants as a class cannot be so easily placed in the fence law camp. Certainly there was a quality distribution of tenants, the better ones presumably receiving a higher remuneration for their services. Not only was the "good" tenant

rewarded because he was more productive, but also because it was in the landowner's interest to retain a high quality tenant who gave more careful attention to the owner's land and livestock. In other words, good tenants may have been able to collect rents because of their scarce, and highly desirable, position among landless laborers. One way to compensate high quality tenants may have been to provide them with pasture on the landowner's farm. Pasture, of course, meant that the tenant did not have to turn his animals out into the forest to nourish themselves. Enclosing animals not only saved valuable time that could be spent on the farm, but it also corresponded to higher quality meat and dairy products because the animals' food intake could be controlled. According to the manuscript agricultural schedules, 40 tenants were able to secure pasture land in Carroll and 46 were able to do the same in Jackson. Although these tenants had pasture, they still had the option to let some of their animals roam the countryside. According to contemporary evidence (see section 5, Appendix A) and the data in Tables 3 and 4, these tenants were given enough pasture to enclose all of their livestock.

From the tenant's point of view, pasture was an item that the landowner and tenant had to negotiate. In the rental contract between James Willbanks and C.M. Wood, a landlord from Harmony Grove, Jackson county, for example, the subject of pasturage was made quite explicit. Not only was Willbanks "to take care of said farm as it was his own," but it was stated also that "there is to be noe pastureing on the land of said place that are in cultivation." [sic]⁵³ If the rental contract forbade pasturing on cultivated acreage, and provided no formal pasture or unimproved land for animals to forage⁵⁴, a tenant then had three options: he could keep no animals, as 6.1 percent of Carroll and Jackson tenants decided; he could pen his animals and feed them purchased grain or fodder grown on his small farm or, similarly, he could rent a plot of pasture; or he could send his livestock out into the forest to find food for themselves. Presumably, most poor tenants chose the latter alternative, but would they all have been hurt by the stock law? As the results underlying Tables 3 and 4 indicate, there were very many tenants who would have benefitted from the stock law, even though they had no pasture. Because so many tenants had so few animals to begin with, the benefits associated with expanding acreage and eliminating large-scale fence maintenance would have exceeded the costs of enclosing and feeding them. In total, about forty-seven percent of the tenants in Carroll and thirty percent in Jackson stood to gain from fencing animals in, instead of fencing them out.

For those tenants expecting a loss from the stock law, the financial injury would have been somewhat tempered by the competitive market for labor.⁵⁵ We can think of the tenant's wage as being composed of two parts. There was an explicit contract with the landlord that determined how much land the tenant could use, how much of the crop he could keep, or, how much rent he would have to pay (depending on the type of contract), and, for example, how much pasture he was permitted. The tenant's total real wage also included an implicit value attached to the option of letting his animals run the countryside. If the latter component were eliminated, then the tenant's real wage would clearly decrease. But the tenant could always move to a county where the open range was still in force. Therefore, if the county that decided to close its range was "small" relative to the surrounding area that retained the open range and tenants could move costlessly, then landowners who wished to adopt the stock law would have to compensate their tenants fully for the losses associated with inaccessibility to the open range.⁵⁶ This scenario is one in which the supply of

labor is completely elastic. If there were some elasticity in supply, however, losing tenants would not have been completely compensated and they still would have expected a net loss from the institutional change.

Since there were some costs of moving, it is unlikely that losing tenants would have been compensated enough to make them completely indifferent between the two institutions. But the power of the competitive market was certainly discussed in the contemporary debate. Jackson county's "Progress", for example, contended that the stock law would make both landowners and their tenants better off. "The income of tenants and wages of hirelings will be regulated by the profits of the land owners Renters now demand houses for their families, and why not demand, under the new law, pasturage for their stock with the same propriety? This they will do and receive it at far less cost to the owner than is required to repair fences." Similarly, the *Jefferson Forest News* editorialized:

It is currently reported that the great majority of the colored people in this county are opposed to it [stock law] upon the idea that most of them are tenants, and that if the stock law is passed they cannot keep any stock on their own account....It is pure fallacy to say that the laborer or tenant, or, as the demagogues have it, the poor man, will suffer by it. The man who will have the burden to bear will be the man who owns the land. He will be compelled to furnish pasturage for his tenants or not get them, and it is impossible for him to do without help.

Richard Baldwin, a black Morgan county resident, speaking in Monroe, Walton county, admitted that he had been opposed to the stock law at first, but upon seeing how the stock law operated in his home county, soon changed his mind and averred that all other blacks had also. Baldwin affirmed that "I know of no man in Morgan county who charges his tenants for pastures. If there was such a man the darkeys wouldn't live with him to save his life." "Tenant" had the same faith in the stock law, believing it to be in ". . . the interest of the tenant fully as much or more than the land-holder, from the fact that whoever furnishes the best pastures will certainly get the best tenants, as it is all bosh about the land-holder being more independent than the tenant, for what is his land worth to him without labor?" In Rockdale county, which was one of the first to pass the stock law, the editor of the county newspaper observed that "landlords see who can arrange the best pastures to secure the best tenants."⁵⁷ Thus, not only do the expected benefit estimates mar Hahn's suggestion that tenants were unanimously in favor of the status quo, so do the predictions of economic theory and the statements of contemporaries about the competitive market.

Arguing that wage laborers, as a group, whole-heartedly supported the fence law may also be uncertain. There is a trace (quite literally) of evidence from the manuscript agricultural schedules that wage laborers kept animals, although they had no land for them.⁵⁸ Having taken advantage of the open range situation, these laborers would certainly experience a decrease in income if a stock law were imposed. Specifically, they would either have to rent the necessary pasture and purchase feed or sell the animals. Alternatively, there were laborers who had no animals and, thus, were probably indifferent between the two laws, at least in the short run. If these individuals expected to own a cow or pig one day, then their interests would lean toward the status quo. However, the

competitive market for wage laborers would have offered some compensation for those who expected a decrease in income from the stock law. Because the data on livestock holding for laborers is very incomplete, it is difficult to predict accurately how they should have fared under a closed range situation. For the 524 farm laborers in Carroll and the 1499 in Jackson, a theoretical prediction as to how they sided on the fence question would be tenuous. In the empirical analysis of the voting returns presented in the next section, I will be able to determine more precisely how this pivotal coalition aligned.

There is one final coalition of likely beneficiaries of the new institution that must be considered, townspeople. Keeping small gardens and very few animals, town residents had an incentive to keep animals, usually swine, from roaming through their relatively densely populated hamlets. The General Assembly, in fact, gave many incorporating towns' mayors and aldermen the right to pass local ordinances forbidding animals from running at large.⁵⁹ The town of Carrollton, the county seat of Carroll, passed its own local ordinance in March, 1886, making it unlawful for animals allowed "willfully and negligently" to run at large within the corporate limits of the town.⁶⁰ As town populations grew with increased industrial activity in the postbellum era, the costs of maintaining the open range (health costs, for example) grew rapidly, creating an incentive to rectify the problem through legislation. The town coalition, however, was quite small, amounting to only 381 (household heads) in Carroll and 206 in Jackson. For the most part, it seems reasonable to hypothesize that the small coalition of town voters would have advocated fence reform, along with landowners and tenants who expected to profit from enclosing livestock.

A glance at the data in Tables 3 and 4 suggests that the coalition of beneficiaries — landowners, tenants, and townspeople — was clearly outnumbered by the losing coalition of landowners and tenants. In Carroll, for example, the expected beneficiaries numbered 1250, including 438 landowners, 431 tenants, and 381 townspeople. The expected losers numbered 983 landowners and 479 tenants. In Jackson there were 688 total expected beneficiaries, including 378 landowners, 104 tenants, and 206 townspeople. These 688 net winners were clearly outnumbered by 751 landowners and 240 tenants who expected to lose if the new institution had been imposed. It is doubtful that laborers in either county would have voted for the stock law with such intensity so as to produce a victory. In fact, each time Carroll and Jackson voters went to the polls, stock law supporters were never able to garner more than twenty–seven to thirty–eight percent of the total votes cast.⁶¹ The median voter was clearly in favor of the status quo. The only chance that the minority coalition had was to bribe, or compensate, those individuals who expected a utility loss from the proposed law. In theory, bribing might have offered a solution to the problem. Realistically though, negotiating for the votes of approximately 1,000 people was probably close to impossible.

The nature of the relationship between relatively wealthy landowners and their tenants and wage laborers could have made transfer payments flow easily. Because landowners and laborers were periodically bargaining with one another to determine the rent or wage, a contingency clause could have been included in the contract, providing the tenant or laborer with the appropriately sized sidepayment to compensate for any expected loss. There are three basic problems with arguing that this type of negotiated settlement would emerge. First, the bargaining was likely to become very expensive. The time needed for both laborer and landowner to determine the appropriate amount of

compensation and then to agree on it could easily outweigh any of the benefits associated with the institutional change. Second, there is the issue of whether or not this type of contractual agreement was credible. Many laborers, no doubt, would have questioned the sincerity of their employer's willingness to pay for their votes after the election was already won. Finally, the problem that would have caused the most damage to a settlement was free riding. Assume that all members of the bribing coalition agreed that each one would "purchase" the votes of his own laborers. Without a mechanism to enforce this pact, each member had an incentive to free ride, enjoying the full benefits of the institutional change without paying his share of the cost. Given that there was no mechanism to keep landowners from defecting, it is not surprising that many counties that could have profited from the stock law, failed to achieve the change. As long as the median voter was against change and sidepayments could not be effected, the status quo, no matter how socially inefficient, would persevere.

There were two obvious solutions to this problem — either voters who had the most to lose by the institutional change could be disfranchised, thereby shifting the median voter toward being a net winner, or a formal mechanism could be created that would eliminate free riding and put the force of law behind the flow of sidepayments. Stock law supporters were able to identify those voters who, in their opinion, blocked the institutional change. "The non land owning class have no right to vote on this subject [fence question]," argued one Carroll county reformer. Another asserted that "there should be a property qualification to every vote cast — own so much property to be allowed to vote It does seem sensible, dont you think, to allow the landholders to say whether they shall fence their lands or not."⁶² According to this plan, landless tenants and laborers, who comprised a large majority of the opposition, could be excluded from voting. Thomas P. Janes, the Georgia Commissioner of Agriculture, in his 1875 annual report made clear his position on the fence question:

Even the present Act, which leaves the question of "fencing stock" or "fencing crops" to the *voters* of the several counties is unjust, since it allows non-freeholders, who generally consist a majority of the voters of every county, to decide a question of policy and economy in which they have no interest. The most equitable way of disposing of the question which, under the present labor system, is a vital one, is by legislative enactment leaving its decision to the *freeholders* of each county.⁶³

Surely, non-freeholders had an "interest" in the matter. It was just the wrong one, from the reformers' perspective. Fence supporters blasted the call for disfranchisement, saying that "such sentiments as these are tyrannical and we are opposed to them from the fact that we live in an independent government by the people."⁶⁴ And the legislature agreed, no special restrictions were ever enacted that eliminated the franchise of specific coalitions of stock law opponents or supporters.⁶⁵

If disfranchisement was not an option, it was possible to manipulate the rules that governed choice in an attempt to create an advantage for the reform movement. In 1881 the Georgia General Assembly dramatically changed the rules of fence elections. Whereas the 1872 act only allowed county voters to decide on the issue once biennially, an 1881 amendment completely removed this

restriction. Now, the ordinary, after the petition sequence, could call for an election at any time, instead of requiring it to be held on the first Monday in July.⁶⁶ Henceforth, that official could set the election date, for instance, during harvest time, when most small farmers, tenants, and laborers were busy with their work. In addition, a county could now hold elections again and again, inevitably dampening turnout, which reduced the number of votes that stock law advocates had to win. This advantage only lasted for two years though, when in 1883 the legislature restricted a county's vote to once per year, the first Wednesday in July.⁶⁷

The most significant legislative change in 1881 permitted referenda on the fence issue at the sub-county militia district level. Similar in spirit to the 1872 act, the militia district law required fifteen freeholders or a majority of the freeholders to file a petition calling for a district election with the county ordinary. After advertising it in a local newspaper for twenty days, the ordinary was required to hold an election as early as possible, although no more than one election could be held in a district every twelve months. There was no counter-petition option provided in this act.⁶⁸ The wording of the ballots also was changed for the district elections. Instead of voting for "no fence" (stock law) or "fence" (status quo) as it was in a countywide referendum, the district election required the ballots to read either "stock law" or "for fence." Although this may appear to be a subtle nuance, its significance will be discussed later. Once a district passed the stock law, it would go into effect six months after the election, and it was the district's responsibility to erect "good and substantial" fences around its circumference in order to prevent strays from other places from entering into the closed range area.⁶⁹ This requirement, at the time, made the cost of adopting the stock law quite high, but it was struck down by the Georgia Supreme Court in 1885. The Court said later in an 1888 case that "The erection of a fence is simply a means for the better carrying out of the law, and not a necessary condition to its going into effect."⁷⁰

The most remarkable feature of the 1881 legislation was that it required the owners or proprietors of land in militia districts that adopted the stock law to provide pasturage for at least one cow and calf for the family of each tenant. This provision came into force if the tenant did his proportionate share of the fencing of the pasture. Indeed, this pasture requirement, which did not pertain to countywide elections, acted as a contingency contract, promising to compensate, at least partially, tenants for their losses after the stock law was adopted. According to contemporary estimates (see Appendix A, section 5), one acre would have been sufficient to pasture a cow and a calf. Given this assumption, the profitability estimates can be recomputed to see if any significant changes would have occurred. If a tenant already had pasture before the institutional change, his estimate would remain the same. However, for tenants who reported no pasture in the 1880 census, I added one acre of pasture to their data and reran the calculation, leaving everything else constant. The results are rather significant. For Carroll county, whereas 47.4 percent of the tenants expected a non-negative net benefit from the stock law even though there was no the pasture allowance, 80.0 percent would have benefitted if the landowner was required to provide an acre of pasture. In Jackson county, the results show the same steep trend, rising from 30.2 percent if no pasture was provided to 71.4 percent with a pasture allotment.⁷¹

The 1881 law allowing district referenda on the fence problem, in effect, made the bargaining between landowners and tenants almost trivial. The pasture sidepayment to tenants that was required by law would have made the law profitable for an additional thirty-two percent of the

tenants in Carroll and an additional forty-one percent in Jackson. Since the law required all landowners hiring tenants to make the transfer payment, free riding off of the bribes of others was impossible. Not only was the possibility of defecting from the cooperative solution eliminated, but the 1881 law also made the compensation scheme a reality.

The 1872 law, along with the 1881 amendments, vastly reduced the power of holdouts against the stock law. Before 1872, a single owner of animals could force every farmer to erect fences to keep his animals out. After 1872, it took a majority in a county. After 1881, a majority in a militia district, a much smaller unit, could, in effect, compel neighboring farmers, as well as fence law supporters within the district, to enclose their stock. At the county level and then the district level, fence law advocates had to win every time; whereas, stock law men had to carry only a single contest. In 1896 the Georgia Supreme Court ruled that once passed, the stock law was irrevocable. "[T]he plain meaning of all the legislative declarations upon the subject," the Court declared, "is, that 'no fence' or the 'stock law,' when once established, shall be permanent and not thereafter subject to change."⁷² The legislature's actions, consistently buttressed by favorable judicial rulings, had biased the rules in favor of reform.

An Empirical Look

The hypothesis advanced in the previous section is that Georgia counties that expected a positive benefit from the stock law were unable to adopt it because the rules governing choice made the cooperative solution, which depended on transfer payments, virtually impossible to achieve. In other words, there was no mechanism to reduce the transactions costs associated with voluntarily bargaining to adopt the more efficient institution. In most cases, the 1872 law did not produce the results that policy makers had probably hoped for — that is, the implementation of the closed range where it would be most profitable. However, the 1881 legislation allowing for militia district referenda changed the rules of the game, creating an opportunity for a landowner/tenant/town coalition to adopt the new institution. This section tests empirically whether the legislature's manipulation of the voting mechanism influenced the outcome.

After three frustrating defeats at the countywide level in Carroll and two in Jackson, stock law supporters began to concentrate their attention on adopting the law at the militia district level. By July 1887, eight of the fifteen districts in Carroll had adopted the stock law in district referenda. In four of these eight districts, however, the fence law had originally been declared the victor, but after being contested on the ground of ballot fraud, the county ordinary overturned the results and declared the districts stock law areas. The precise wording of the law, no doubt, created confusion among voters as the county election ballots were required to read either "fence" or "no fence," the latter meaning the stock law. However, as stated previously, the district election ballots had to be either "for fence" or for the "stock law." The election in Carroll's Bowdon district was particularly "muddled" as the precinct managers certified the result in favor of the fence law 102 to 73. However, the actual vote cast was 73 for "stock law," 68 "for fence," 30 for "fence," 2 for "a fence," and 2 for "the fence." The county ordinary, after hearing arguments from both sides, threw out the 34 votes not cast "for fence," thus leaving a majority of 73 to 68 for the "stock law."⁷³ And in the remaining four districts that adopted the stock law through legal balloting, the law won with very

slight majorities. Therefore, by taking advantage of legal ambiguities and by concentrating their attention on the much smaller districts, stock law supporters were able to close the open range of Carroll and Jackson counties little by little.

As individual districts forced the enclosure of their own animals, they increased the cost to neighboring communities of maintaining the open range. When a district passed the stock law, it meant that neither indigenous nor foreign animals were permitted to roam freely within its borders. Therefore, another coalition of supporters emerged as neighboring areas opted for the institutional change. A person living in an open range district, but next to a stock law district or county was doubly burdened by the fence law in his own community. Not only did the "liner," as they called themselves, have to fence in his own farm from neighbors' roving animals, but he also had to enclose his own livestock so that they would not stray into an adjacent stock law area. I.H.P. Beck, a stock law supporter, understood the consequences of keeping the fence law in the midst of reform: "If Bowdon district gets the stock law, what are we poor fellows in Shiloh to do, situated as we will be between two districts that have adopted it. I reckon we will have to 'huddle up' in the middle of the district." In fact, as the date of Shiloh's district election approached, Beck conjectured: "It seems to me that if liners would vote for their interest success would be inevitable."⁷⁴ Voters in Shiloh rejected the arguments and maintained the status quo, 47 to 27.⁷⁵

While voter confusion and "cross-over" effects may explain some of the transition to the stock law, to what extent did the pasture requirement of the 1881 law offer sufficient compensation to convert would-be losers into stock law voters? To answer this question, I will analyze the aggregate voting behavior of individual districts within Carroll and Jackson counties. From 1881 to 1890, Carroll county held five countywide fence elections — in January, 1882; September, 1882; July, 1885; July, 1887; and July, 1890. Jackson county held two countywide elections, one in July, 1881, and another in September, 1883. In addition, many of the militia districts held local-option elections, which were sporadically and incompletely reported in the newspapers. I was, however, able to collect the election returns from fourteen of these district elections. As mentioned above, the county ordinary overturned the results of many district elections. Therefore, in the data analysis, I use the figures that were reported by the precinct managers and not the results that emerged from litigation. The vote reported out of the district represents the "true" sentiment of the voters; by using the final result determined by the ordinary, I would be misrepresenting the actual intention of the voters.

Two sets of hypotheses will be tested: (1) In countywide elections, various coalitions voted for the option (stock law or status quo) that promised to maximize their net returns. In other words, did landowners and tenants who, if my assumptions are accurate, would have expected a non-negative profit from the stock law actually translate this belief into votes for the new institution? Alternatively, did those farmers who anticipated a loss, support the open range with vigor? Did town dwellers vote for the closed range as might be predicted? Finally, which alternative did wage laborers support? (2) The second hypothesis is that the 1881 rule changes governing district elections offered enough incentive to "buy" the votes of tenants who previously had no pasture and would have, under the pre-1881 structure, expected a net loss from the closed range policy.

The dependent variable in the empirical analysis is voting behavior. Exactly how this will be operationalized is discussed below. The independent variables for the test are the percentages of the population (of household heads) that fall into one of seven coalitions – winning landowners (WL), losing landowners (LL), winning tenants (WT), losing tenants (LT), townspeople (TOWN), rural laborers (LABOR), and other workers (OTH) not living in towns or working in agriculture (e.g., blacksmiths or artisans). With my 100 percent matched sample of the population and agricultural schedules of Carroll and Jackson, I am able to determine precisely the values of the independent variables for each district in the two counties. The final independent variable used is the percentage of the eligible electorate not voting (ABSTAIN). When an individual district adopted the stock law, this did not prohibit it from voting in forthcoming countywide elections. As Kousser and I show in "Common Sense or Commonwealth," once a district adopted the stock law, its voters subsequently abstained in great numbers.⁷⁶ Therefore, in the regressions that follow, ABSTAIN is included as an independent variable so as to hold turnout constant.

A minimum logit chi-squared model is used for the econometric estimation of voting behavior. The derivation of the model is detailed in Appendix B. The basic equation being estimated, however, is:

$$\log \left(\frac{P_{STK(it)}}{1 - P_{STK(it)}} \right) = \alpha + \beta X_{it} + \epsilon_{it},$$

where $P_{STK(it)}$ is the percentage of the ballots cast for the stock law in district i at election time t , X_{it} is the matrix of independent variables, and ϵ_{it} is a randomly distributed error term. Since, by construction, the error term is heteroskedastic, the estimation must include a correction for this problem. The correction is done by multiplying both sides of the above equation by the square root of N , the number of eligible voters.

The first goal is to determine how the various coalitions voted during the countywide elections. The results reported in column (1) of Table 5 are based on a cross-section time-series regression of all districts in the two counties for all seven countywide elections that took place. The numbers in column (1) show how a change of one standard deviation from the mean of the particular variable (holding all else constant) affected the probability of voting for the stock law. The data for this estimation includes only the countywide elections and none of the local-option district elections. Note that the estimated probability of voting for the stock law when all variables are set at their means is 0.248.

The hypothesis that voters clashed according to material self-interest is very much supported by the data. As the results in column (1) indicate, an increase (by one standard deviation) in the percentage of landowners who expected a loss from the stock law meant that the stock law would lose four percentage points. The proposed law's support was bolstered by 6.4 points when there were relatively more tenants who expected a net gain and by 8.7 percent when there was a higher proportion of the voters living in towns. These three results are statistically significant at conventional levels ($\leq 5\%$ level). Unfortunately, the coefficients for landowning winners and tenant losers were not significantly different from zero in the regression. Moreover, the data confirm that laborers were solidly against the stock law in countywide referenda. Increasing the share of laborers in a district by one standard deviation decreased the stock law's vote by eleven percentage points.

Finally, higher voter abstention corresponded to greater relative support for the institutional change. As mentioned above, once districts adopted the stock law, voters began to abstain in large numbers. When the closed range was voted in, the decision was final, and there really was no reason to vote in a countywide election. Kousser and I show that instead of imposing their views on districts that retained the open range, fence law and stock law partisans followed a strategy of "allegiance to local control." That is, they decided to leave the fence question to those who had a direct interest in the matter. The regression results show that this decreased political activity was stronger among fence law partisans. An increase in the percent of the electorate abstaining corresponded to a significant increase (4.8) in the percent voting for the stock law. Thus, the data refute the historians' hypothesis that poor landowners, tenants, and laborers were uniformly against the stock law policy. Instead, as the profitability estimates predicted and as the voting analysis now confirms, there was a group of tenants who united with their landowners and their town neighbors in an attempt to capture the efficiency gains associated with a closed range.

The next objective is to determine how the changing rules that governed choice affected voting behavior. If the theory presented in the previous section is accurate, then many tenants expecting a loss should have voted for the stock law in district elections, as they they would have received about an acre of pasture if the law were passed. In order to capture the effects of the rule change, I pool the countywide and districtwide voting returns. Because not all districts held elections and because some districts' elections returns were not recorded in the county newspapers, the number of observations in the analysis drops substantially. Since the goal is to distinguish the voting behavior of specific coalitions under both voting regimes, the only way to obtain unbiased estimates of the behavioral change is to analyze districts for which countywide and districtwide election data exist. Since only thirteen of twenty-nine districts in Carroll and Jackson are represented in the study, it is very difficult to say confidently that the results offer a general picture of the voting behavior in every district of the two counties. Therefore, the results should be approached somewhat cautiously.

Since the 1881 law's pasture requirement was directed at tenants, and at laborers who were working their way toward becoming tenants, three new independent variables are created to test whether tenants (expected winners and loser) and laborers voted any differently in district referenda. The additional variables are interaction terms between each of the tenant coalitions and the laborer coalition and a dummy variable that takes the value of 1 if the observation is a district election (1881 rules), and 0 if it is a countywide election (1872 rules). The interaction variables are denoted "WT*DISTRICT," "LT*DISTRICT," and "LABOR*DISTRICT" in Table 5.

Column (2) in Table 5 reports the results of including the interaction terms in the estimation. The increased support for the stock law at the district level is difficult to pin down precisely. Surprisingly, winning tenants decreased their support for the closed range policy in district elections, lowering the stock law's probability of success by 0.032 (relative to a countywide election). This result is not statistically significant at conventional levels, however. According to the computations in column (2), the coalition of losing tenants dramatically increased the probability of adopting the stock law in a district election by 13.1 percentage points (again, relative to a countywide election). Note, however, that because of the relatively small number of districts involved, this estimate is not significant at conventional levels. What is statistically significant is the increase in support by

laborers voting in district elections. They boosted the stock law's share of the ballots an additional 12.4 percentage points over the countywide probability. One explanation for this result might be that many laborers anticipated a relative quickly move into tenancy, where they would be guaranteed pasture by law. An alternative hypothesis might be that the laborers' strong support was the result of vigorous canvassing by stock law supporters. Since the district election involved many fewer people and a smaller geographic region, it is possible that the transaction costs associated with bribing laborers were reduced enough to enable stock law supporters to create a winning coalition that included labor acquiescence (compensated, of course).

It is clear that with the changed election rules, stock law supporters were able to enhance the size of their coalition just enough to carry the fence election at the district level. The estimation predicts that the stock law could garner 53.2 percent of the ballots cast in district elections. In a democracy, fifty percent is a threshold — the 1881 district option law was truly successful in building a minimum winning coalition.

Illuminating the Black Box

Throughout the mid-1880s, Carroll county slowly adopted the stock law district by district and by 1891 practically the whole county was under the closed range policy. Figure 2 plots the sequence of adoption as a function of the expected net savings in each district. A regression line fitted through the data reveals the strong correlation between the net benefits that the institutional change promised to generate and the sequence of implementation. In general, this pattern provides evidence for the theory that institutional change comes about as the discounted stream of expected net benefits exceeds zero. But is positive profitability a necessary and sufficient condition for change to take place?

Net profitability of a proposed institutional change is hardly a sufficient condition for the transformation to occur. Before the Georgia General Assembly began to legislate on the fence question, transaction costs made a voluntary, large-scale closing of the range virtually impossible. A voluntary solution required the unanimous consent of all animal owners to enclose their livestock, and a single person could hold up reform. Under the 1872 law allowing majority rule at the county level, however, it took more than half of the eligible voters in a county to maintain the status quo. With the median voter against reform, sidepayments, or bribes, had to be paid to compensate losers (at least a coalition of them) for their expected losses in utility if access to the open range were cut off. But again, transaction costs associated with overcoming free riding among the beneficiaries and the actual process of paying bribes most likely made the 1872 law ineffective. Finally, the legislature redesigned the rules of fence elections in 1881. The 1881 pasture requirement apparently was designed to compensate at least some of the expected losers. More importantly, the law forced all landlords to pay the bribe — free riding was no longer a feasible strategy.

The 1881 law did more than to provide a mechanism to overcome the compensation and free rider problems, it created an opportunity for fence reformers to use chicanery in their attempt to close the range. In five instances the Carroll county ordinary threw out invalid votes for the fence law, leaving a majority for the new institution. The five districts that had originally voted to keep the open range, but later had their votes overturned, are represented by darkened circles in Figure 2.

Note that three of the five expected net social losses if the stock law were imposed. Net benefits, therefore, need not be a necessary condition for institutional change to take place. The mechanism that governs choice can be manipulated in such a way that allows a subset of the population to profit at the expense of society as a whole.

In Jackson county five of thirteen districts and two townships were able to adopt the law in the mid 1880s, but the vast majority of the county maintained the status quo. Recall that Jackson would have benefited greatly from the stock law. Therefore, it should not be surprising that Jackson, along with many other counties in the same situation, experienced a third rule change — in 1889, by special legislative act, the General Assembly declared that Jackson county's range was closed.⁷⁷ It is particularly surprising that most Jackson districts, where the stock law would have generated large net benefits, did not even hold a district referendum. One possible hypothesis to explain the less than enthusiastic support for fence reform is that the predominant share of voters in Jackson were agricultural laborers, amounting to 35 percent of the white voters and 86 percent of the black. Conceivably, landowners who had the most to gain from fence reform did not push for a closing of the range, fearing that laborers would migrate to neighboring counties that kept the open range. Economic theory predicts that the competitive market for labor would have compensated laborers to the point where the income of staying with the new institution, plus the compensation, was equal to the utility of living in an open range area, less the cost of moving there. If moving costs were just about zero, then laborers could have expected their wages to increase enough to make them indifferent between staying or leaving. Whether laborers believed that they would actually get the wage compensation is certainly a debatable question. From the landowners' point of view, the probability of upsetting the equilibrium of the labor force in their district may have made the cost of adopting the stock law too great relative to the benefits it may have brought. Therefore, the landowners' strategy to maintain the status quo, at least throughout the 1880s, may have been a calculated attempt to keep a steady labor force in Jackson county.

While Carroll and Jackson counties expected to gain much from the stock law, their relative delay in adopting the law illustrates the arduous, dynamic process of institutional change. The potential for efficiency gains did not guarantee the replacement of an old by a new institutional arrangement. It seems ironic that the proponents of the "new institutional economics" have largely ignored the particular rules that are so crucial to the outcome in any specific case. Too often the process of change is relegated to a "black box" description which ignores the complex interaction between rules and economic outcomes. Future work on institutional change must ask: "What are the consequences of a particular set of decision rules? [And] how [do] those decision rules change over time and produce alterations in the property rights structure?"⁷⁸ In particular, when transaction costs and distributional conflicts hinder the adoption of a relatively profitable institutional arrangement, what type of mechanisms are likely to emerge in order to resolve the impasse? More attention needs to be paid to the precise arrangements that govern choice, for they will play a determining role in whether inefficient institutions persist or whether they are replaced by more efficient institutional arrangements.

APPENDIX A

Procedure Used to Calculate Expected Savings from Stock Law

1.) Wasted Land

Contemporaries believed that the largest potential source of savings from the stock law could be achieved by literally breaking down the fences and bringing into production that land previously occupied by fence rows. As discussed in the text, the waste percentage used to calculate the individual counties' expected savings is 1.5 percent. When I calculate the savings for individual farms, I determine the percent of wasted land using the function specified in footnote 29 below.

2.) Crops Grown on Wasted Land

I assume that two types of crop are grown on the wasted acreage. Cotton will be grown on the cotton producing acres and corn, peas, and fodder will be grown on the corn, wheat, rye, and oat acres (for simplicity, grain acres). Yield per acre for cotton and corn was determined by dividing the total crop output by total acres of that particular crop. For the corn yield per acre measure I subtract 0.25 bushels per acre for seed.⁷⁹ The yield per acre of peas and fodder is assumed to be 4 bushels and 185 pounds, respectively, as reported in the "Annual Report of Thomas P. Janes Commissioner of Agriculture of the State of Georgia For the Year 1875," p. 135. The total crop of corn, peas, and fodder grown on the extra land brought into cultivation is equal to the number of extra grain acres times the yield per acre of the respective crop. Similarly, the total extra cotton crop is equal to the extra cotton acres times the yield per acre of cotton. Since the yield per acre is reported in bales, I multiply the total output by 475, the average weight of a bale of cotton, to obtain total pounds of extra cotton grown.⁸⁰

3.) Gross Value of Crops Grown on Wasted Land

After finding the total number of bushels or pounds of each crop that could be grown on the wasted acreage, I multiply the figure by the price per unit. The price of cotton is assumed to be \$0.1118 per pound and corn is assumed to be \$0.673 per bushel. These are the average prices for the year 1880 as reported in the *Atlanta Constitution*. I sampled the newspaper once every month, trying to obtain prices for the fourth day of each month. If the price was not reported on the fifth, I went to the sixth, seventh, and so on. The price of peas is assumed to be \$1.10 per bushel and fodder \$0.0119 per pound as reported in "The Annual Report...1875," p. 135.

4.) Cost of Producing Crops

"The Annual Report...1875," p. 135, reports the cost of producing corn, peas, and fodder on the same land as \$8.00 per acre. Assuming an interest rate of 7 percent, an annual land depreciation rate of 2.7 percent⁸¹, and a cash value per acre of Georgia farms of \$4.67, the cost of producing the corn, peas, and fodder becomes \$8.45 per acre.⁸² We have the benefit of two cost estimates for cotton. "The Annual Report...1875," p. 135, reports the production cost of cotton to be \$16.48 per acre, and includes the cost of marketing the crop. R.H. Loughridge, "Report on the Cotton Production of the State of Georgia, with a Description of the General Agricultural Features of the State," in the 1880 Agricultural Census, p. 175, has several cost estimates for various counties within Georgia. Loughridge's figures correspond very closely to the \$16.48 reported by the Georgia Department of Agriculture and, thus, I use this estimate to predict the total cost of producing the extra cotton crop, with one adjustment. The \$16.48 figure includes the cost of fencing the acre of cotton land. Therefore, the "real" cost of planting an acre of cotton becomes \$14.58 (see section 6, below, for \$1.90 fence cost). It should be noted that this estimate includes the rental price of the land.

An additional cost of producing the extra crops is the opportunity cost of the capital used to work the land, specifically any machinery, farm implements, or draft animals. We first determine the value of machinery capital per acre by dividing the "value of farming implements and machinery" by the total number of cotton, corn, wheat, rye, and oat acres. To estimate the machinery rent associated with producing the extra crop, I multiply the per acre value of machinery by the total acres brought into cultivation by the depreciation and interest rate. We take the rate of depreciation to be 15 percent, following Ransom and Sutch, p. 108, and Robert C. Allen.⁸³ Again, the interest rate is assumed to be 7 percent.

To find the rent associated with work animals, I determine the total value of such animals, because the Census reports the value of all farm animals. Using the 1879 prices given in the *Historical Statistics of the United States, Colonial Times to 1957*, Series K 195–212, p. 290, for horses (\$51.55), mules (\$57.08), and all cattle (\$16.96), I am able to estimate the total value of capital in the form of horses, mules, and oxen. By the same procedure used for machinery and implements, I determine the value per acre of work animals used to produce all crops within a county. Using a depreciation rate of 15 percent (Allen, p. 952) and an interest rate of 7 percent, the total rent for animals associated with producing the additional crops is the value of work animals per acre times 22 percent times the total number of wasted acres brought into cultivation.

5.) Dealing with Animals

Because many animals were roaming the open range, I need to take into account the pasturing and feeding of these animals once the hypothetical stock law is implemented. The Census reports acres of "Permanent meadows, Permanent pastures, orchards, and vineyards" and I take this lump sum to represent the total amount of land devoted to animal pasture. The "Annual Report...1875" gives data on total pasture enclosed by fence, and for more than 80 counties, the Georgia Department of Agriculture reports a pasture measure greater than the Census' enhanced pasture statistic. Therefore, I do not believe that using the Census pasture variable will bias the result in any dramatic fashion.

To this permanent pasture I allocate animals so that I can obtain an estimate of the number of animals that were roaming the countryside. First, I allocate 5 sheep per acre of pasturage ("Annual Report...1875," p. 128), then sequentially allocate one horse, mule, ox, milk cow, head of cattle per acre, and if possible, 5 swine per acre. The Jackson *Herald*, August 31, 1883, reports that six cows and twelve hogs could be put on a six acre pasture sown in vetch for the summer. Moreover, the March 30, 1885 *Herald* reported that one acre of pasture per cow was suitable. Given this, one acre devoted to each horse, mule, ox, head of cattle, and milk cow is a generous estimate. Furthermore, five pigs per acre seems reasonable, given that five sheep per acre was the norm, and taking into account the *Herald's* 1883 advice.

Once I have determined the number of animals that were non-pastured, I must deduct from the savings estimate a feed allowance for these animals. Before the stock law is instituted, I assume that farmers fed their non-pastured animals the Ransom and Sutch "Lower bound" feed estimate reported in Table E.4, p. 250. Once the hypothetical law is implemented, these animals must be put into pastures and I assume that they are now fed the Ransom and Sutch "Reasonable allowance, 1880" of corn-equivalent bushels. Of course, I need not allocate feed to previously pastured animals because I assume they were fed the "Reasonable allowance" before and after the law. In fact, the feed allowance only has to be made for horses, mules, and oxen because grain given to milk cows, cattle, and swine was consumed by the farm family in a different form, namely meat, milk, cheese, butter, etc. Therefore, the dollar value of the feed is equal to $\$0.673/\text{bushel corn} * (n_{\text{horses}} * 11.7 \text{ bushels} + n_{\text{oxen}} * 11.7 \text{ bushels} + n_{\text{pmules}} * 14.5 \text{ bushels})$, where "np" represents "non-pastured."

6.) Fence Maintenance Savings

Contemporaries claimed that the depreciation of fences amounted to 10 percent of the initial value of the fence. However, as described above, previously non-pastured animals require a fence enclosure, and I assume that these animals are penned on unimproved land.⁸⁴ Assume that each non-pastured horse, mule, ox, head of cattle, and milk cow was given one acre of land and one acre was allocated for 5 sheep and swine. Call the land used to pasture the previously non-pastured animals, "new fenced acres." In addition, I have assumed that all

of the fences around crops are removed and, thus, no longer require repair expense. Call the amount of land used to grow the cotton and grain crops before the hypothetical stock law, "crop acres." Using the fact that the average cost of fencing in the South was \$1.90 per acre, I am able to estimate the amount saved from maintaining fewer fences. Thus, the fence savings is equal to $0.10 * \$1.90 * (\text{crop acres} - \text{new fenced acres})$.

I also must take into account the cost of fencing the "new fenced acres" devoted to penning the animals. Denoting the one-time cost of this fence as C_0 , its value is given by $\$1.90 * (\text{new fenced acres})$.

7.) Total Expected Savings

The total annual expected savings once the hypothetical law is passed is obtained by adding the gross value of the additional crops grown and the money saved from maintaining fewer fences and subtracting the total cost of producing the crop, including the rent on the capital, and the value of the feed allowance given to previously non-pastured horses, mules, and oxen. A general equation for the savings after the first year can be written as:

$$\begin{aligned} \text{Total expected savings (S)} = & x\% \text{ cotton acres} * [\text{bales/acre} * 475 \text{ lbs/bale} * \$0.1119/\text{lb} - \\ & \$14.58 \text{ cost/acre} - \$\text{rent of capital/acre}] + x\% \text{ grain acres} * [(\text{bushels corn/acre} * \\ & \$0.673/\text{bushel} + 4 \text{ bushels peas/acre} * \$1.10/\text{bushel} + 185 \text{ lbs fodder/acre} * \$0.0119/\text{lb}) \\ & - \$8.45 \text{ cost/acre} - \$\text{rent of capital/acre}] - \$0.673/\text{bushel com} * [11.7 \text{ bushels} * \\ & n_{\text{horses}} + 11.7 \text{ bushels} * n_{\text{oxen}} + 14.5 \text{ bushels} * n_{\text{pmules}}] + 0.10 * \$1.90 * [\text{crop} \\ & \text{acres} - \text{new fenced acres}], \end{aligned}$$

where $x\%$ represents the percentage of tilled acreage wasted by fence rows. The savings of the first year that the law is in force is slightly different. All of the profits from the crops as well as the depreciation from the crop acre fences are realized as savings. However, in the first year the full value of C_0 is subtracted off and the depreciation from these fences need not be subtracted. Thus, the net present value of the expected savings is $\sum_{t=0}^{\infty} S_t - 0.9 C_0$, where 0.9

C_0 is the cost of the animals' fences plus the first year's depreciation which is embedded in the S_t term.

APPENDIX B

Assuming that the error terms are distributed according to the logistic cumulative distribution, the probability of voting for option j is given by

$$P_j = \frac{e^{\beta_j' X}}{e^{\beta_0' X} + e^{\beta_1' X}}, \quad (1)$$

where X is the matrix of independent variables, β_j' is the vector of coefficients, $j = \{0, 1\}$ indexes the voters' possible actions — voting for the fence law or the stock law, respectively, and $P_0 + P_1 = 1$. Dividing P_1 by P_0 reduces to

$$\frac{P_1}{P_0} = \frac{P_1}{1 - P_1} = \frac{e^{\beta_1' X}}{e^{\beta_0' X}}. \quad (2)$$

Taking the log of $\frac{P_1}{1 - P_1}$ yields

$$\log \left[\frac{P_1}{1 - P_1} \right] = \beta_1' X - \beta_0' X = (\beta_1' - \beta_0') X. \quad (3)$$

I will henceforth call the expression $(\beta_1' - \beta_0') X$, $\beta' X$

The equation to be estimated, however, is

$$\log \left[\frac{\hat{P}_1}{1 - \hat{P}_1} \right] = \beta' X + \mu, \quad (4)$$

where $\mu = \log \left[\frac{\hat{P}_1}{1 - \hat{P}_1} \right] - \log \left[\frac{P_1}{1 - P_1} \right]$. A Taylor series expansion of $\log \left[\frac{\hat{P}_1}{1 - \hat{P}_1} \right]$ around p_1 yields

$$\mu \approx (\hat{p}_1 - p_1) \left[\frac{1}{p_1} + \frac{1}{1 - p_1} \right] = \frac{1}{p_1(1 - p_1)} (\hat{p}_1 - p_1). \quad (5)$$

Equation 5 ignores higher order terms of the Taylor expansion. Thus, in large samples, $E(\mu) = 0$, and

$$\text{Var}(\mu) = \frac{1}{(p_1(1 - p_1))^2} \cdot \frac{p_1(1 - p_1)}{n} = \frac{1}{np_1(1 - p_1)}. \quad (6)$$

In estimating equation 4, then, the error term will be heteroskedastic. A correction is made by multiplying both sides of equation 4 by the square root of n , the number of eligible voters, before estimating it. This estimation is known as the minimum logit chi-squared method. The discussion of the above model follows G.S. Maddala, *Limited Dependent and Qualitative Variables in Econometrics* (New York: Cambridge University Press, 1983), pp. 29–30.

Once β has been computed, probability estimates of voting for either option can be computed. Algebraically manipulating equation (3), the estimated probabilities of voting for the fence law (\hat{P}_0) and the stock law (\hat{P}_1) are:

$$\hat{P}_0 = \frac{1}{1 + e^{\beta \bar{X}}} \quad (7)$$

and

$$\hat{P}_1 = \frac{e^{\beta \bar{X}}}{1 + e^{\beta \bar{X}}}. \quad (8)$$

The final step in determining the estimated probabilities is to specify an \bar{X} matrix. This is traditionally done by setting the independent variables at their sample means.

TABLE 1

**DISCOUNTED NET PRESENT VALUE OF EXPECTED PROFITABILITY
OF STOCK LAW, BY REGION**

REGION	<i>N</i>	WEIGHTED MEAN ^a	PER CAPITA ^b	AS % OF VALUE OF PRODUCE ^c	IMPROVED ACREAGE (%) ^d
MOUNTAIN	17	\$-12,895 ^e	\$-2.00 ^e	-7.1%	24.3%
UPCOUNTRY	26	108,769	6.97	16.1	36.9
PLANTATION BELT	63	167,439	10.31	21.2	42.3
PINE BARRENS	9	-101,365	-14.96	-35.1	13.0
WIREGRASS	16	-81,708	-14.75	-39.2	12.0
COAST	6	-82,203	-6.34	-29.6	12.6
COUNTIES WITH LAW BY 1882 ^f	14	191,195	11.91	21.7	46.8
STATE	137	69,474	5.19	11.9	31.4
CARROLL ^g COUNTY	1	119,116	7.05	14.8	36.2
JACKSON COUNTY	1	209,755	12.87	26.7	35.5

Notes: ^a Weighted by *total* acres in each county.

^b The per capita measure was computed according to the following formula: $\frac{\sum_{i \in R_j} SS_i}{\sum_{i \in R_j} POP_i}$,

where j indexes the respective region, i indexes the counties within a region, and "POP" is population.

^c The savings as a percentage of the value of produce measure was computed according to

the following equation: $\frac{\sum_{i \in R_j} SS_i}{\sum_{i \in R_j} VPRD_i} * 100$, where "VPRD" is the value of produce for

the single year, 1879. To determine the savings as a percent of the net present value of the value of produce, multiply the percentage given in the Table by seven percent, the interest rate used in the calculation.

^d The column shows the weighted average of the percentage of improved acreage in each region. The weighting is by total acres in each county.

^e 1880 dollar values.

^f These counties are: Butts (1882), Campbell (1881), Clayton (1881), Coweta (1881), Henry (1882), Lincoln (1882), Meriwether (1881), Monroe† (1881), Morgan (1882), Pike (1882), Putnam† (1881), Rockdale (1882), Spaulding (1882), and Troup (1881). Number in parentheses is the year of adoption. A dagger means that the legislature imposed the stock law on the county without a popular vote.

^g Since I have a 100 percent sample of the census data from Carroll and Jackson counties, I was able to check the aggregate sums presented in the Census with the sums of my individual level data. For the most part, the data are consistent. There was one variable, however, that was very different and is important for my calculation – the amount of pasture in Carroll. The Census aggregate amount reported is about double that calculated using the micro-data. Therefore, in the calculation here, I use the smaller estimate. If the Census number is used, the benefit rises to \$237,667.

Sources: See Appendix A.

TABLE 2

DISTRIBUTION OF ESTIMATED BENEFITS AND LOSSES FROM STOCK LAW, BY REGION

RANGE OF BENEFIT/LOSS	MOUNTAIN	UPCOUNTRY	PLANTATION BELT	PINE BARRENS	WIRE- GRASS	COAST	TOTAL
-\$250,000 -- -\$201,000	0	0	0	1	0	0	1
-\$200,000 -- -\$151,000	1	0	0	1	3	0	5
-\$150,000 -- -\$101,000	2	0	2	4	5	2	15
-\$100,000 -- -\$51,000	5	3	0	1	3	3	15
-\$50,000 -- -\$1	2	1	4	1	4	1	13
\$0 - \$49,000	2	3*	5*	1	0	0	11
\$50,000 - \$99,000	2	3*	13*	0	1	0	19
\$100,000 - \$149,000	1	10*	11**	0	0	0	22
\$150,000 - \$199,000	2	4	13**†	0	0	0	19
\$200,000 - \$249,000	0	1	8*†	0	0	0	9
\$250,000 - \$299,000	0	1	3*	0	0	0	4
\$300,000 - \$349,000	0	0	2*	0	0	0	2
\$350,000 - \$399,000	0	0	0	0	0	0	0
\$400,000 - \$449,000	0	0	1	0	0	0	1
\$450,000 - \$499,000	0	0	1	0	0	0	1

Notes: Each star represents a county that had adopted the stock law by 1882. A dagger indicates a county that had the stock law imposed by the state legislature.

Source: See Appendix A.

TABLE 3

CARROLL COUNTY — CHARACTERISTICS OF COALITIONS

VARIABLE	PS \geq 0 & OWNER	PS < 0 & OWNER	ALL OWNER- OPERATED FARMS	PS \geq 0 & TENANT	PS < 0 & TENANT	ALL TENANT- OPERATED FARMS
<i>N</i>	438	983	1421	431	479	910
MEDIAN NET BENEFIT	\$80.18	-\$108.62	-\$61.26	\$75.44	-\$77.72	-\$9.25
TILLED ACREAGE	49.87	44.60	46.22	29.08	29.41	29.25
COTTON ACREAGE	11.66	9.73	10.33	9.52	8.06	8.75
PASTURAGE	8.02	0.10	2.54	1.40	0.03	0.67
FOREST	85.64	103.20	97.79	16.09	21.63	19.01
OTHER UNIMPR.	7.53	4.68	5.56	0.68	0.84	0.76
HORSE	0.46	0.71	0.63	0.15	0.54	0.35
MULE	0.62	0.87	0.79	0.17	0.56	0.37
OX	0.15	0.54	0.42	0.03	0.41	0.23
MILK COW	1.68	1.84	1.79	1.01	1.23	1.12
CATTLE	2.40	2.76	2.65	1.02	1.45	1.25
SWINE	8.18	9.17	8.86	3.31	5.08	4.24
SHEEP	2.76	5.71	4.80	0.53	2.30	1.46
PERCENTS	30.8	69.2	—	47.4	52.6	—

Notes and Sources: The data were collected from the Agricultural Manuscript Schedules, Carroll County (100% sample).

The expected net benefit was computed using the procedure described in Appendix A. The data reported are means for the particular column heading.

TABLE 4

JACKSON COUNTY — CHARACTERISTICS OF COALITIONS

VARIABLE	PS ≥ 0 & OWNER	PS < 0 & OWNER	ALL OWNER— OPERATED FARMS	PS ≥ 0 & TENANT	PS < 0 & TENANT	ALL TENANT— OPERATED FARMS
<i>N</i>	378	751	1129	104	240	344
MEDIAN NET BENEFIT	\$116.38	-\$120.31	-\$58.21	\$73.66	-\$87.18	-\$57.73
TILLED ACREAGE	68.68	54.34	59.14	34.48	32.62	33.18
COTTON ACREAGE	21.03	16.01	17.69	15.42	13.69	14.21
PASTURAGE	9.46	0.29	3.36	5.25	0.06	1.63
FOREST	101.43	77.97	85.82	58.64	44.37	48.68
OTHER UNIMPR.	38.62	36.64	37.30	19.56	22.61	21.69
HORSE	1.10	1.04	1.06	0.54	0.90	0.79
MULE	0.96	1.10	1.05	0.49	0.83	0.73
OX	0.13	0.28	0.23	0.08	0.12	0.11
MILK COW	2.08	1.95	1.99	1.52	1.62	1.59
CATTLE	3.10	2.75	2.87	2.04	1.90	1.94
SWINE	8.82	8.00	8.27	5.60	6.00	5.88
SHEEP	2.63	4.22	3.69	1.15	1.98	1.73
PERCENTS	33.5	66.5	—	30.2	69.8	—

Notes and Sources: The data were collected from the Agricultural Manuscript Schedules, Jackson County (100% sample). The expected net benefit was computed using the procedure described in Appendix A. The data reported are averages for the particular column heading.

TABLE 5

MARGINAL EFFECTS ON THE PROBABILITY OF VOTING FOR THE STOCK LAW^a

(Results are derived from a minimum logit chi-squared estimation)

VARIABLE	(1)	(2)
LABOR ^b	-0.111*	-0.087*
WL	0.034***	0.001
LL	-0.036***	-0.042**
WT	0.064*	0.074**
LT	0.000	-0.035
TOWN	0.085*	0.063*
ABSTAIN	0.048*	0.042**
WT*DISTRICT	-	-0.032
LT*DISTRICT	-	0.131
LABOR* DISTRICT	-	0.124**
\hat{P}_1 (county) ^c	0.255	0.306
\hat{P}_1 (district)	-	0.532
<i>N</i>	92	57
R^2	0.323	0.484
\bar{R}^2	0.275	0.385

- Notes:
- * Significant at ≤ 0.01 level, two tailed test.
 - ** Significant at ≤ 0.05 , but > 0.01 level, two tailed test.
 - *** Significant at ≤ 0.10 , but > 0.05 level, two tailed test.
 - ^a The marginal effects reported are the result of increasing each independent variable by one standard deviation from its mean (holding everything else constant) and then determining how it changed the baseline probability (all variables set at their means).
 - ^b To determine the marginal effect that laborers had on the vote, I reran an equation using LABOR instead of TOWN and determined the marginal effect on that equation.
 - ^c This is the estimated probability of voting for the stock law in a countywide election, setting all of the independent variables at their means. The next row reports the predicted probability assuming a district election, governed by 1881 rules.

Sources: Countywide voting returns were collected from the *Carroll County Times*, January 13, 1882; *Carroll County Times*, September 15, 1882; *Carroll Free Press*, July 3, 1885; *Carroll Free Press*, July 8, 1887; *Carroll Free Press*, July 4, 1890. *Jackson Herald*, July 8, 1881; *Jackson Herald*, September 14, 1883. District referenda returns were collected from the *Carroll Free Press*, September 18, 1885; *Carroll Free Press*, March 11, 1887; *Carroll Free Press*, March 18, 1887; *Carroll Free Press*, April 1, 1887; *Carroll Free Press*, June 24, 1887; *Carroll Free Press*, July 8, 1887; *Carroll Free Press*, September 9, 1887; *Carroll Free Press*, December 16, 1887; *Carroll Free Press*, February 22, 1889; *Jackson Herald*, October 23, 1885; *Jackson Herald*, April 23, 1886; *Jackson Herald*, September 2, 1887; *Jackson Herald*, November 11, 1887. The landowner and tenant coalitions were determined using the procedure detailed in the Appendix. All of the coalitions were computed using a 100 percent matched sample of the agricultural and population manuscript schedules of Carroll and Jackson counties.

TABLE A1

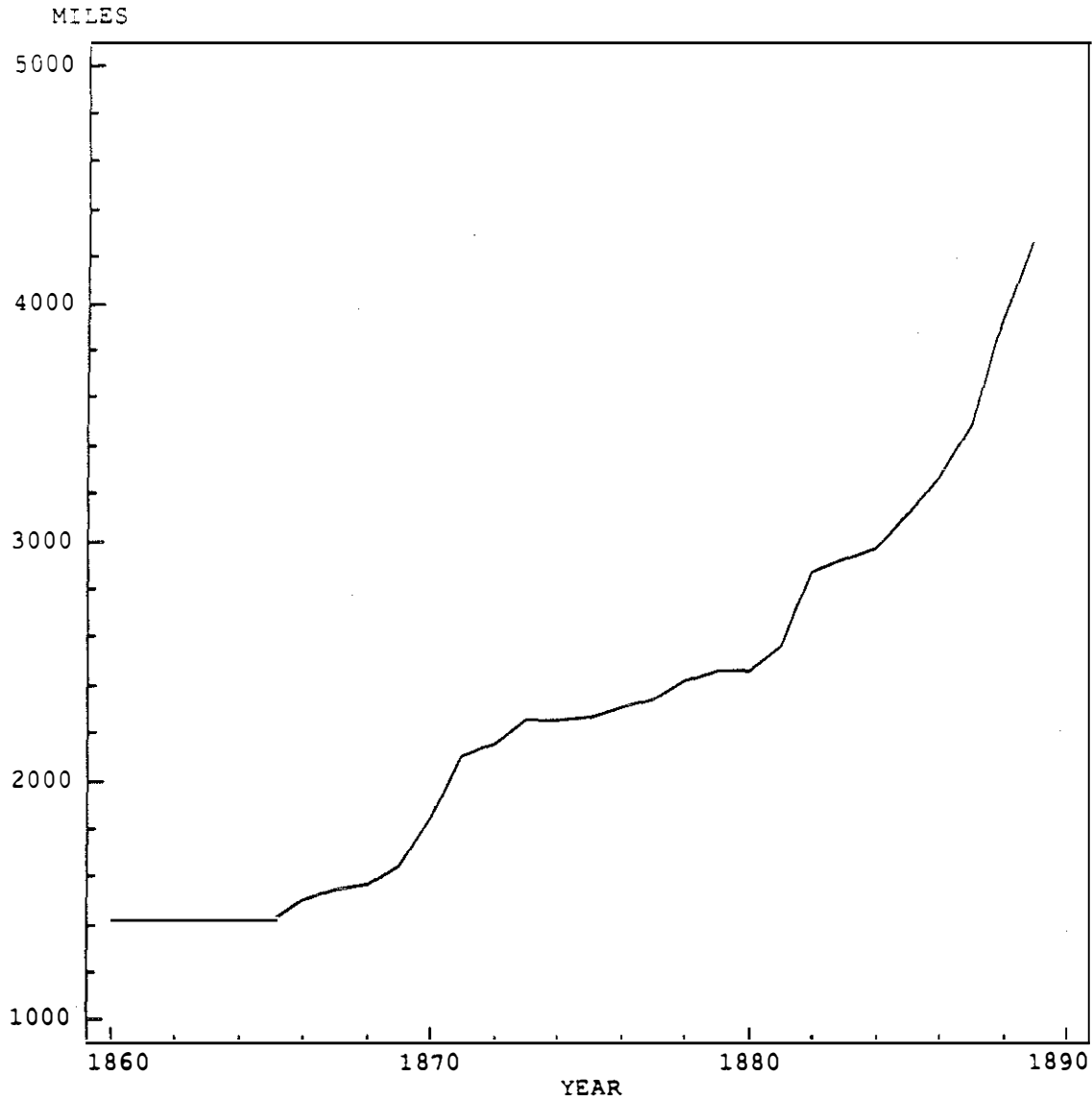
**MEAN DISCOUNTED NET PRESENT VALUE OF EXPECTED PROFITABILITY
OF STOCK LAW, BY REGION — SENSITIVITY ANALYSES**

		MODEL (see below)					
REGION	N	A	B	C	D	E	F
MOUNTAIN	17	\$-12,962	\$-12,845	\$-58,943	\$-107,304	\$-7,821	\$-36,604
UPCOUNTRY	26	158,709	71,315	51,131	-35,099	119,289	51,171
PLANTATION BELT	63	240,455	112,678	145,254	90,239	156,193	84,220
PINE BARRENS	9	-128,527	-80,992	-161,844	-186,172	-221,549	-98,396
WIREGRASS	16	-103,818	-65,125	-103,014	-144,316	-106,084	-78,534
COAST	6	-106,653	-63,866	-99,943	-143,229	-138,405	-66,666
COUNTIES WITH LAW BY 1882	12	297,354	141,775	180,094	114,199	203,340	113,387
STATE	137	104,770	43,002	35,436	-18,546	48,633	20,438
CARROLL COUNTY	1	176,765	75,879	-4,547	-154,756	132,801	52,530
JACKSON COUNTY	1	301,077	141,263	103,813	-29,425	188,478	137,720

LEGEND OF MODELS:

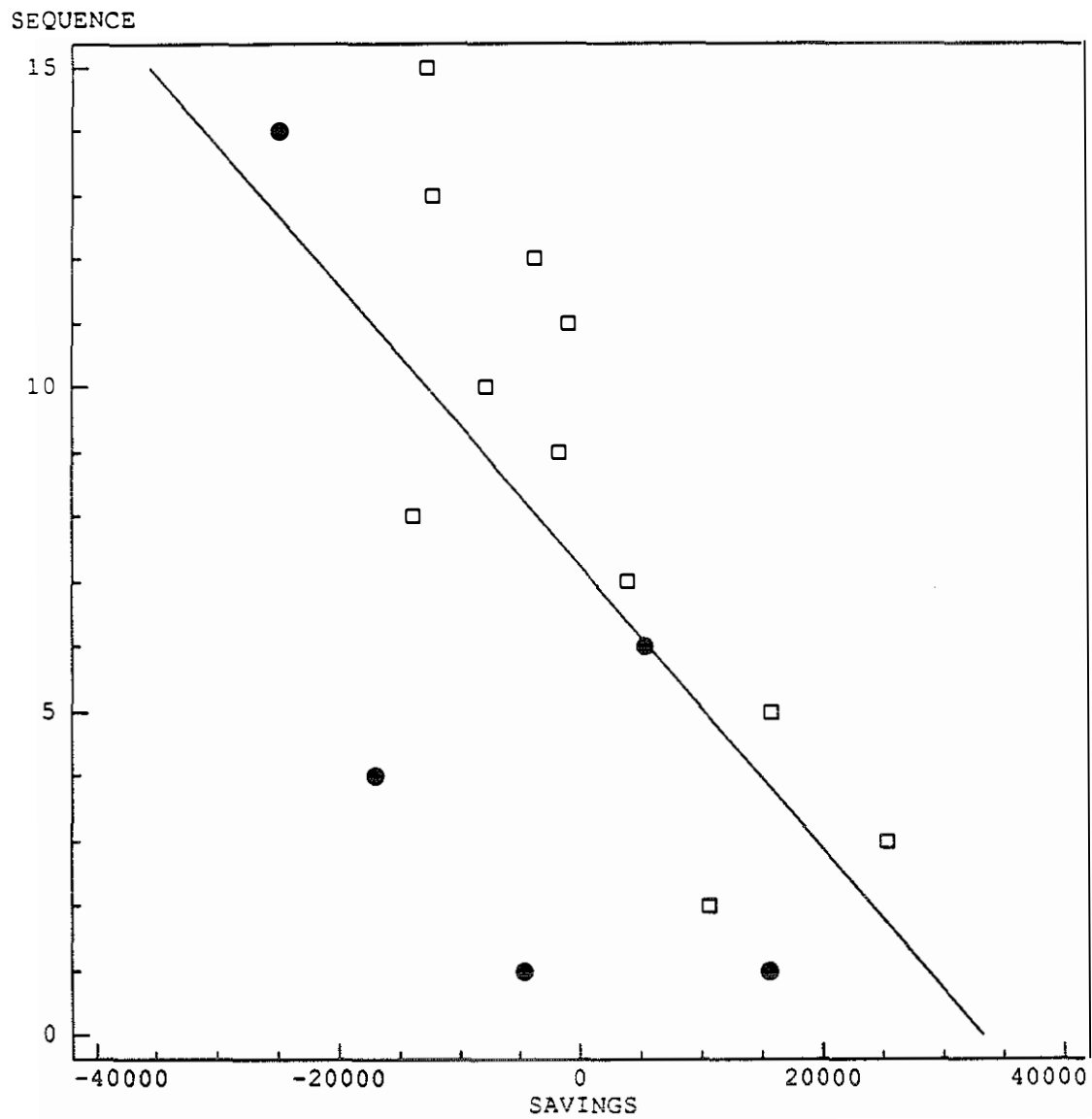
- A Discount rate set at 5 percent, instead of 7.
- B Discount rate set at 10 percent, instead of 7.
- C Reported available pasturage reduced by 25 percent.
- D Reported available pasturage reduced by 50 percent.
- E Prices of cotton and corn were determined by estimating a hedonic pricing model. That is, the value of produce grown in the county (reported in the Census) was regressed on the various amount of agricultural produce produced in a county. Individual regions were dummied out so as to determine differences in the prices of cotton and corn across regions. The calculation produced the following results (price for bale of cotton, price for bushel of corn): Mountain (37.55, 0.55); Upcountry (55.84, 0.39); Plantation Belt (44.15, 1.02); Pine Barrens (30.59, 1.48); Wiregrass (49.41, 0.90); Coast (30.59, 1.48). The prices used in the original calculation was (53.15, 0.67).
- F The cost of building new fences was assumed to be 0.95, one half the amount asumed in the original calculation.

FIGURE 1
LENGTH OF RAILROAD TRACK MILEAGE IN GEORGIA, 1860–1889

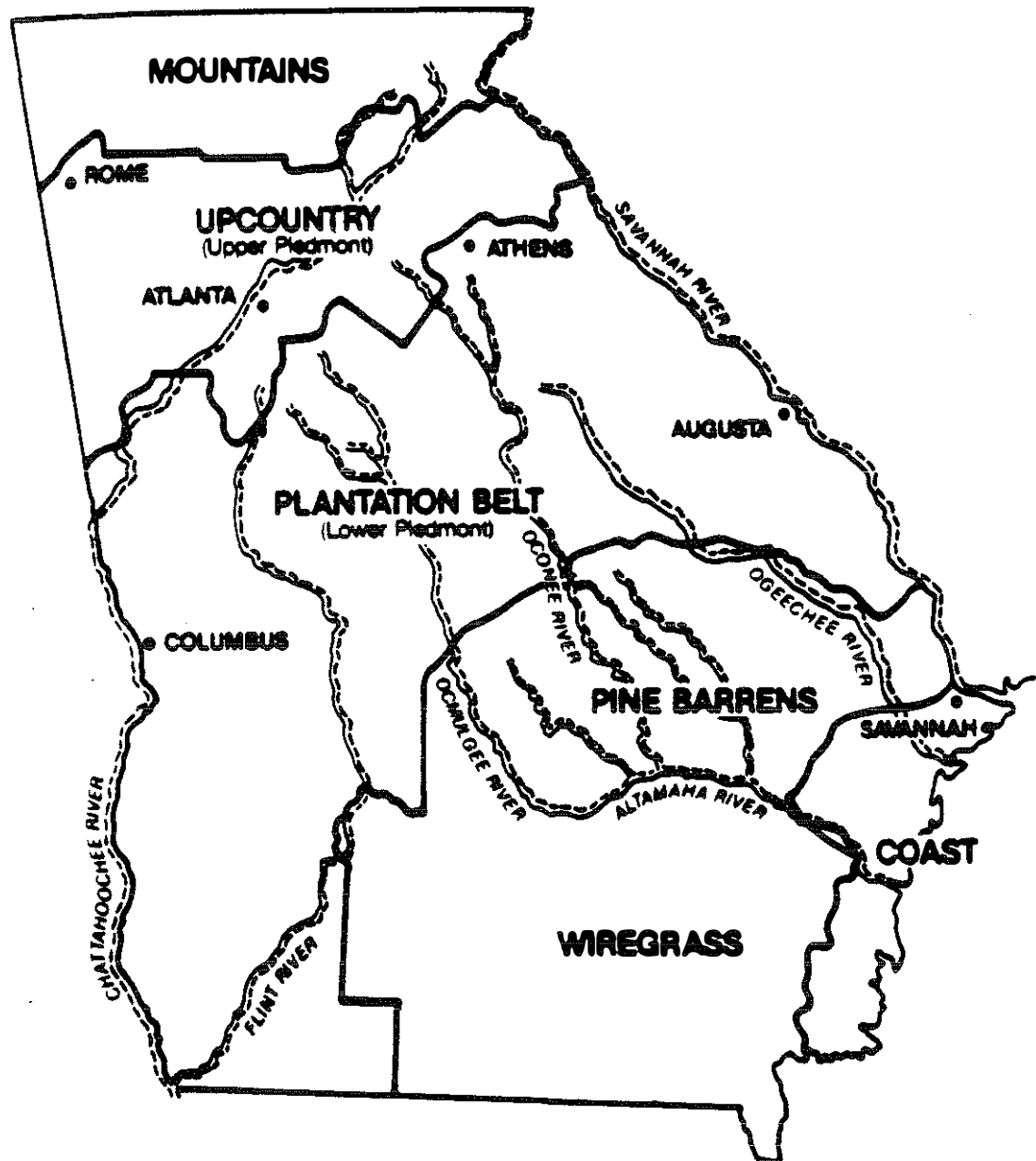


Sources: *Poor's Manual of Railroads of the United States for 1874–5* (New York: J.J. Little & Co., 1875), pp. xxviii–xxix; *Ibid.*, 1885, p. xiv; *Ibid.*, 1890, p. vi.

FIGURE 2
SEQUENCE OF ADOPTION BY EXPECTED SAVINGS, CARROLL COUNTY



MAP 1
GEORGIA REGIONS



Source: Steven Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850–1890* (New York: Oxford University Press, 1984), p. 7.

FOOTNOTES*

*I gratefully acknowledge financial support from the Alfred P. Sloan Foundation, the John Randolph Haynes and Dora Haynes Foundation, the Anna and James McDonnell Memorial Scholarship Fund, and the Division of the Humanities and Social Sciences at Caltech. Participants at the 1989 All-UC Economic History Conference and the 1990 Cliometrics Conference offered valuable comments. Lance Davis, Avner Greif, Morgan Kousser, John Ledyard, and Jean-Laurent Rosenthal have been particularly generous with the provision of comments and criticisms during my work on this paper. Naturally, I am to blame for any of the shortcomings herein.

1. Harold Demsetz, "Toward a Theory of Property Rights," *American Economic Review*, 57 (May 1967), p. 350. For similar arguments see Lance E. Davis and Douglass C. North, *Institutional Change and American Economic Growth* (Cambridge, Eng.: Cambridge University Press, 1971); Douglass C. North and Robert Paul Thomas, *The Rise of the Western World: A New Economic History* (Cambridge, Eng.: Cambridge University Press, 1973); Terry L. Anderson and P.J. Hill, "The Evolution of Property Rights: A Study of the American West," *Journal of Law and Economics*, 18 (April 1975), pp. 163–79; and John R. Umbeck, *A Theory of Property Rights: With Application to the California Gold Rush* (Ames, IA: The Iowa State University Press, 1981).
2. Ronald Coase, "The Problem of Social Cost," *Journal of Law and Economics*, 3 (October 1960), pp. 1–44.
3. Douglass C. North, *Structure and Change in Economic History* (New York: Norton, 1981), p. 7 and pp. 42–3.
4. Several recent papers have dealt with the problem that imperfect information plays in the attainment of an efficient cooperative solution. George J. Mailath and Andrew Postlewaite, "Asymmetric Information Bargaining Problems with Many Agents," mimeo, University of Pennsylvania, June 1988, study a situation in which all members of a society must agree to the building of a public good. Furthermore, they assume that each individual has private information about his valuation of the proposed public good. Even if the project would generate net positive benefits, Mailath and Postlewaite show that as the group of decision makers approaches infinity, it is impossible to devise a mechanism that will induce everyone to reveal their true preferences. Therefore, the probability that a socially beneficial action will be taken goes to zero under these seemingly innocent informational constraints. Raphael Rob, "Pollution Claim Settlements Under Private Information," *Journal of Economic Theory* 47 (April 1989), pp. 307–33, suggests a framework in which a pollution-generating firm and many potential victims have to decide whether or not to build the factory. Since residents are injured by the pollution, both parties (victims and firm) must bargain (in a

Coasean sense) to an outcome. Rob shows that when individuals have private information regarding their expected damage, inefficient outcomes will likely emerge as equilibria. In fact, the inefficiencies can be quite substantial when the number of bargainers is large. It could reach a point where a relatively profitable factory, for example, would not be constructed because the firm believed that its profits would be negative (reported damages exceed expected profits).

Vincent C. Crawford, "A Theory of Disagreement in Bargaining," *Econometrica*, 50 (May 1982), pp. 607–37, shows that voluntary movements away from a status quo point can break down as one party in a bargaining situation precommits to carry out a threat (such as to break off negotiations). Although the threat seems to be a good strategy for the bargainer (the strategy may be ex ante efficient), the broken negotiations may prevent the adoption of relatively profitable institutions (the strategy in this case is ex post inefficient).

5. See, for example, George J. Stigler, "The Theory of Economic Regulation," *Bell Journal of Economics and Management Science*, 2 (Spring 1971), pp. 3–21; Sam Peltzman, "Toward a More General Theory of Regulation," *Journal of Law and Economics*, 19 (August 1976), pp. 211–248; Gary Becker, "A Theory of Competition Among Pressure Groups for Political Influence," *Quarterly Journal of Economics*, 98 (August 1983), pp. 371–400.
6. For a discussion of Georgia's geography, see R.H. Loughridge, "Report on the Cotton Production of the State of Georgia, with a Description of the General Agricultural Features of the State," U.S. Census Office, Tenth Census, 1880, volume 6, pp. 260–450 and Roland M. Harper, "The Natural Resources of Georgia," *Bulletin of the University of Georgia*, 30 (February 1930), pp. 7–29.
7. Breaking the state into these six geographic regions follows Robert Preston Brooks, "The Agrarian Revolution in Georgia 1865–1912," *Bulletin of the University of Wisconsin*, History Series 3 (1914), pp. 393–524 and, later, Steven Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850–1890* (New York: Oxford University Press, 1984), p. 7.
8. Oliver Wendall Holmes, *The Common Law* (Cambridge, MA: Belknap Press, 1963), p. 22 and John H. Ingham, *The Law of Animals: A Treatise on Property in Animals Wild and Domestic and the Rights and Responsibilities Arising Therefrom* (Philadelphia: T. & J.W. Johnson & Co., 1900), p. 258.
9. Holmes, *Common Law*, p. 22, note 64 and Ingham, *Law of Animals*, pp. 301–309.

10. For a discussion of the development of the "fence law," or open range, policy in America see Washburn and Moen Manufacturing Co., *The Fence Question in the Southern States as Related to General Husbandry and Sheep Raising, with the History of Fence Customs, and Laws Pertaining Thereto: And a View of the New Farm System of the South, as Shown in the Census of 1880*, (Worcester, MA: Snow, Woodman & Co., 1881), 10–14. For a discussion of New England, in particular, see William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983), chapter 7.
11. Washburn and Moen, *Fence Question*, p. 44.
12. *Ibid.*, p. 11. Italics in original.
13. Hahn, *Roots*, pp. 60–1. The Georgia General Assembly, in the early nineteenth century, did reduce the legal height of fences by a foot, however.
14. *Hamilton v. Howard*, 68 GA Reports 288 (1881).
15. *Tumlin v. Parrott*, 82 GA Reports 732 (1889).
16. Horace Greeley, *What I Know of Farming: A Series of Brief and Plain Expositions of Practical Agriculture as an Art Based Upon Science* (New York: Tribune Association, 1871), p. 219.
17. "Fructus" in *Southern Cultivator*, 35 (August 1877), p. 299.
18. *Jefferson Forest News*, April 23, 1880.
19. The debate between fence law and stock law advocates is quite interesting and covers the gamut of economic, political, religious, and social issues. Since the debate has been covered in depth in previous works, I will not dwell on it here. See Shawn E. Kantor and J. Morgan Kousser, "Common Sense or Commonwealth? The Fence Law and Institutional Change in the Postbellum South," Social Science Working Paper 703, California Institute of Technology, July, 1989; Steven Hahn, *Roots*, pp. 239–54; Charles L. Flynn, Jr., *White Land, Black Labor: Caste and Class in Late Nineteenth-Century Georgia* (Baton Rouge: Louisiana State University Press, 1983), pp. 130–145; James C. Bonner, *Georgia's Last Frontier: The Development of Carroll County* (Athens, GA: University of Georgia Press, 1971), pp. 139–143.
20. Demsetz, "Toward a Theory," p. 350. See also Demsetz, "Some Aspects of Property Rights," *Journal of Law and Economics*, 9 (October 1966), pp. 61–70.

21. Davis and North, *Institutional Change*, chapters 1–4.
22. *Jackson Herald*, July 20, 1883. Georgia farmers understood well the importance of healthy agricultural development. Petitioning the state legislature for the establishment of more experimental farms, the Georgia State Agricultural Society conceded that "other pursuits may have more brilliant rewards, and other industries may claim more flattering recognition, but this truth underlies all our hopes of material prosperity, that with a languishing agriculture all other business enterprise and investment must suffer." "Report of the Georgia State Agricultural Society to Establish More Experimental Farms in the State: 1884–5," Georgia Department of Archives and History, Record Group 37, Sub-group 8, Series 4, Box 1, pp. 1–2.
23. See, for example, *The Georgia Railroad Company and Banking Company v. Neely*, 56 GA Reports 540 (1876); *The Central Railroad v. Hamilton*, 71 GA Reports 461 (1883); *The Georgia Railroad Company and Banking Company v. Walker*, 87 GA Reports 204 (1891); *The Central Railroad v. Summerford*, 87 GA Reports 626 (1891).
24. The amount of "stock damage — paid for cattle, horses, mules, hogs, etc., killed and injured" was obtained from the "Report of the Chief Engineers, President and Superintendents of the South–Western Railroad Company, of Georgia," 1861, 1866, and 1869; "Reports of the Directors, &c. of the Georgia Railroad and Banking Company to the Stockholders in Convention," 1877; and "Reports of the President and Superintendent of the Atlanta and West–Point Railroad Company, to the Stockholders in Convention," 1880 and 1884. From each report I determined the amount of livestock killed per mile of track operated. Then I converted the figure to 1880 dollars using the Warren and Pearson Wholesale Price Index, Series E–12, *Historical Statistics of the United States, Colonial Times to 1957*. The results, in tabular form, are:

Year	\$/mile (1880 \$)
1861	\$29.55
1866	13.82
1869	11.79
1877	29.21
1880	23.76
1884	11.28

The average is \$19.90 per track mile, the amount used in the text for computational purposes.

25. The \$1,000,000 figure is the discounted net present value of the stream of estimated payments that Georgia railroads would have made to livestock owners after 1879. For the calculation, I assume that the railroad track mileage remained constant after 1889. This biases the estimate downward. The discount rate used is seven percent, following Ransom and Sutch, *One Kind of Freedom: The Economic Consequences of Emancipation* (New York: Cambridge University Press, 1977), p. 208.
26. See Hahn, *Roots*, pp. 145–52 and David F. Weiman, "The Economic Emancipation of the Non-Slaveholding Class: Upcountry Farmers in the Georgia Cotton Economy," *Journal of Economic History*, 45 (March 1985), pp. 71–93.
27. Contemporaries believed that fences depreciated at an annual rate of ten percent. See *Jefferson Forest News*, April 23, 1880. Also, see the "Extract from a lecture by Donald J. Mitchell, before Connecticut Board of Agriculture," *Southern Cultivator*, 34 (December 1876), p. 465, for annual depreciation estimates of between 11.1 and 18.2 percent.
28. In a letter to the *Southern Cultivator*, 36 (January 1878), p. 7, a "Subscriber" maintained that the fence occupied a total distance of seven feet across. It should be noted that "Subscriber" was a pro-fence advocate. Washburn and Moen, *The Fence Question*, p. 16, whose ultimate goal was to advertise the benefits of using barbed wire, claimed that eight feet of land was wasted by the worm fence. Therefore, since I want to bias my results against finding a net benefit, I will assume the lower wastage estimate of seven feet.
29. If worm fences spanned seven feet and crops were grown in perfectly square plots of land, with sides of length x feet, then the percentage of productive land wasted can be expressed as a function $l(x) = \frac{(28x - 196)}{x^2}$. I use feet, instead of acres or hectares, for simplicity.
Assuming square plots of land, it is easy to convert acres into the length x feet. Note that one acre of land is 43,560 square feet. Therefore, if given the acreage, a , of a piece of land, the length of the sides $x = \sqrt{43,560a}$ feet.
30. See "Consolidated Reports of Crops, &c., Circular No. 21," in *Publications of the Georgia State Department of Agriculture from September, 1874, To January, 1878* (Atlanta: J.P. Harrison & Company, 1878). It seems reasonable to assume that corn, peas, and fodder were all planted together.
31. Assuming that individuals did not take into account the costs that they imposed on others, then in the "common pool" setting, they equated only their own private marginal benefits to the private marginal costs of grazing animals on unfenced land. With no exclusive property rights to the use of such "common" land, each person had an incentive to increase his herd size to higher levels than he would have if he had to provide his animals with his own pasturage. In other words, the fence law created an incentive for animal owners to ignore the

full social cost of keeping animals and to create an aggregate herd size greater than the one that would have been theoretically optimal for society.

32. 1882 is chosen as the date for comparison because (1) It is a decade after the Georgia legislature enacted a law allowing for county option of the fence issue (see below) and (2) The period from 1880 to 1882 saw the relatively quick adoption of the stock law at the county level which gives me the opportunity to pick out the salient features of these early stock law counties.

33. Several probit estimations were attempted in order to determine the distinguishing features of the 1882 stock law counties. The only variable that is significant is the percentage of improved acreage. Variables such as black population percentage, percent of the farms owner occupied, or population density are never significant at conventional levels (0.05).

34. It should be noted that Carroll and Jackson counties were not chosen because of their stature as relatively high expected beneficiaries from the stock law. In fact, and fortunately, this happened as a matter of luck. The decision to collect the microdata (discussed below) for the two upcountry counties was made before the profitability estimates were computed. The Carroll and Jackson data was collected so as to test the hypotheses presented by Steven Hahn (*Roots of Southern Populism*), who focused on the two aforementioned counties. See Kantor and Kousser, "Common Sense or Commonwealth," for a theoretical and empirical challenge to Hahn's theses.
 As it turns out, Hahn's choice of counties (again fortunately) allows me to pursue a related branch of research on the dynamics of institutional change. If the two counties had been net losers from the stock law, the range of interesting questions that could have been asked would surely have been limited. Instead, an analysis of these two very profitable counties enables me to put theories of institutional change to rigorous empirical testing.

35. On the socioeconomic diversity across the South and within states, see Louis Ferleger, "Self-Sufficiency and Rural Life on Southern Farms," *Agricultural History*, 58 (July 1984), pp. 314–29 and Jay Mandle, "The Plantation States as a Subregion of the Post-Bellum South," *Journal of Economic History*, 24 (September 1974), pp. 732–38.

36. For a theoretical discussion of this type of bargaining breakdown, see James M. Buchanan and Gordon Tullock, *The Calculus of Consent* (Ann Arbor: University of Michigan Press, 1965), pp. 99, 106–9; Davis and North, *Institutional Change*, pp. 17–8; Kenneth J. Arrow, "The Property Rights Doctrine and Demand Revelation Under Incomplete Information," in Michael J. Boskin, ed., *Economics and Welfare: Essays in Honor of Tibor Scitovsky* (New York: Academic Press, 1979), pp. 23–39; William J. Samuelson, "A Comment on the Coase Theorem," in Alvin E. Roth, ed., *Game-Theoretic Models of Bargaining* (Cambridge, Eng.: Cambridge University Press, 1985), pp. 321–39; Mailath and Postlewaite, "Asymmetric Information," and; Robb, "Pollution Claim Settlements," For a different type of

bargaining breakdown see Crawford, "Theory of Disagreement." For historical discussions of costly bargaining situations similar in spirit to the stock law, see Donald N. McCloskey, "The Economics of Enclosure: A Market Analysis," in William N. Parker and Eric L. Jones, eds., *European Peasants and Their Markets*, pp. 132–3; Jean-Laurent Rosenthal, "The Fruits of Revolution; Property Rights, Litigation and French Agriculture 1700–1860," unpublished California Institute of Technology doctoral dissertation, 1988, pp. 90–112; and Philip T. Hoffman, "Institutions and Agriculture in Old-Regime France," *Journal of Institutional and Theoretical Economics*, 145 (March 1989), pp. 166–181.

37. *Winters v. Jacobs*, 29 GA Reports 115 (1859). [The information identifying the case is tentative at this point.]
38. Georgia Supreme Court Case File of *George H. Tumlin vs. Charles C. Parrott*, Georgia Department of Archives and History, A–15581, box 246, location #247–01.
39. *Ibid.*
40. *Tumlin v. Parrott*, 82 GA Reports 732 (1889).
41. Robert Frost, "Mending Wall," in Edward Connery Lathem, ed., *The Poetry of Robert Frost* (New York: Holt, Rinehart and Winston, 1969), p. 33.
42. Georgia Session Laws, 1872, No. 329, pp. 34–6.
43. This arrangement was upheld by the Georgia Supreme Court in *Tharpe v. Hardison*, 69 GA Reports 280 (1882). In addition, the Court declared that only freeholders could contest an election after it was held.
44. *Proceedings of the Georgia State Agricultural Society, from August, 1876 to February, 1878* (Atlanta: J.P. Harrison & Co., 1878), p. 417. In fact, most of the Agricultural Society's discussion concentrated on the diverse incentives for the stock law across the state.
45. J.T. Henderson, *Report of the Commissioner of Agriculture of the State of Georgia, Embracing the Years 1881 and 1882* (Atlanta: J.P. Harrison & Co., 1882), p. 209.
46. *Ibid.*
47. Thomas P. Janes, "June Crop Report — 1879," in *Publications of the Georgia State Department of Agriculture for the Year 1879* (Atlanta: J.P. Harrison & Co., 1880), p. 3.

48. There is evidence to *suggest* that at least some members of the legislature tried for the state-wide version of the stock law. In the beginning of the 1872 session, Representative McWhorton introduced "A bill to create a stock law in the state." (See Georgia House *Journal*, 1872, p. 13) Unfortunately, the Journal did not copy the text of the bills introduced, and the original copy of it is missing from the Archives. Given the title of the bill, however, it could be tentatively concluded that McWhorton wanted the stock law for the entire state.
49. Georgia Senate *Journal*, 1873, pp. 38, 50, and 86. The Committee on Agriculture is listed on p. 45.
50. Georgia House *Journal*, 1875, pp. 157, 259, and 484.
51. Flynn, *White Land, Black Labor*, p. 145.
52. Hahn, *Roots*, pp. 248 and 262.
53. "Day Book of C.M. Wood," in the A.D. O'Rear Collection, Georgia Department of Archives and History.
54. In Carroll county 714 of 910 (78.5%) tenant farmers reported no pasture or unimproved land and in Jackson county 144 of 344 (41.9%) tenants were in the same situation according to my 100-percent sample of the Agricultural Manuscript Schedules.
55. The competitiveness of the postbellum southern labor market is discussed by Robert Higgs, *Competition and Coercion: Blacks in the American Economy, 1865–1914* (New York: Cambridge University Press, 1977); Stephen J. DeCanio, *Agriculture in the Postbellum South: The Economics of Production and Supply* (Cambridge, MA: The MIT Press, 1974); and Joseph D. Reid, "Sharecropping as an Understandable Market Response: The Postbellum South," *Journal of Economic History* 33 (March 1973), pp. 106–30.
56. By "small" I mean to imply that each individual county could not change the price of labor by upsetting the supply or demand. In other words, both buyers and sellers of labor in a single county take the wage as given.
57. *Jefferson Forest News*, June 24, 1881; *Jefferson Forest News*, June 10, 1881; *Jackson Herald*, July 20, 1883; *Jackson Herald*, September ?, 1885; *Jackson Herald*, August 24, 1883. Similarly, see A.R. Burch, in *Newnan Herald*, June 30, 1881.
58. See pages 3 and 5 of the 1880 Carroll county agricultural schedules for Oscar Entrekin and Jackson L. Price, respectively.

59. See Georgia Session Laws, 1871, O. no. 209, p. 109 and O. no. 190, p. 128.
60. *Carroll Free Press*, March 26, 1886.
61. *Carroll County Times*, January 13, 1882; *Carroll County Times*, September 15, 1882; *Carroll Free Press*, July 3, 1885; *Carroll Free Press*, July 8, 1887; *Carroll Free Press*, July 4, 1890. *Jackson Herald*, July 8, 1881; *Jackson Herald*, September 14, 1883.
62. *Carroll County Times*, May 3, 1878; *Carroll County Times*, June 7, 1878.
63. Georgia Department of Agriculture, *Annual Report of Thomas P. Janes, Commissioner of Agriculture of the State of Georgia for the Year 1875* (Atlanta: J.H. Estill, 1876), p. 66. Italics in original.
64. *Carroll County Times*, June 21, 1878.
65. From 1871, however, Georgia voters were required to pay a \$1.00 cumulative poll tax. Black and poor white men were increasingly disfranchised because of their inability to pay the tax. Of course, stock law supporters could have paid the tax of poor men in return for their votes. Kousser and I, "Common Sense or Commonwealth," have thoroughly analyzed the public debate of the fence question in Carroll and Jackson counties and have found no suggestion that stock law supporters paid the taxes of their poor neighbors. For a discussion of the effects of the poll tax, see J. Morgan Kousser, *The Shaping of Southern Politics: Suffrage Restriction and the Establishment of the One-Party South, 1880–1910* (New Haven: Yale University Press, 1974), chapter 3 and pp. 209–23.
66. Georgia Session Laws, 1881, No. 110, pp. 60–1.
67. Georgia Session Laws, 1883, No. 134, pp. 49–51.
68. This legislation was upheld in *Meadows v Taylor*, 82 GA Reports 738 (1889).
69. The law allowing militia district option is in Georgia Session Laws, 1881, No. 401, pp. 79–81. In *Jones v. Sligh* (75 GA Reports 7 (1885)) the Court declared that it was unconstitutional for the county ordinary to levy and to collect a tax upon the property of a militia district in order to build and to maintain a fence around a district that voted for the stock law. This virtually meant that the fence requirement was invalidated. Then in *Dover v. The State of Georgia* (80 GA Reports 781 (1888)), the Court was more direct. It ruled that the stock law would still go into effect in a militia district that voted for the law even though it did not have a fence surrounding its borders. See also *Holleman v. Kingery*, 81 GA Reports 624 (1888).

70. *Dover v. The State of Georgia* (80 GA Reports 781 (1888)), p. 784.
71. An alternative way to interpret the pasture law is to suppose that the landowner would give the tenant an acre of pasture, but, at the same time, would reduce the tenant's tilled acreage by an acre. Calculating the estimates according to this assumption does not change the results in any dramatic fashion. In Carroll, 76.1 percent (instead of 80.0) of the tenants would have favored the stock law and the sidepayment. In Jackson, 70.5 percent (instead of 71.4) would have been in favor of the closed range.
72. *Newton v. Ferrill*, 98 GA Reports 216 (1896).
73. *Carroll Free Press*, March 18, 1887; *Carroll Free Press*, March 25, 1887.
74. *Carroll Free Press*, March 11, 1887; *Carroll Free Press*, May 20, 1887. See also I.H.P. Beck's correspondence in *Carroll Free Press*, June 10, 1887 and an anonymous letter to the editor in *Carroll Free Press*, July 1, 1887.
75. *Carroll Free Press*, June 24, 1887.
76. Kantor and Kousser, "Common Sense," pp. 18-9.
77. Georgia Session Laws, 1889, No. 788, pp. 1278-9.
78. Douglass C. North, "Government and the Cost of Exchange in History," *Journal of Economic History*, 44 (June 1984), p. 256.
79. Ransom and Sutch, *One Kind of Freedom: The Economic Consequences of Emancipation* (New York: Cambridge University Press, 1977), Table E.1, p. 246.
80. Weiman, "Economic Emancipation," p. 76, footnote 12.
81. Ransom and Sutch, *One Kind of Freedom*, p. 208.
82. "Annual Report...1875", p. 135. .
83. Robert C. Allen, "The Efficiency and Distributional Consequences of Eighteenth Century Enclosure," *The Economic Journal* 92 (December 1982), p. 952.
84. For evidence that animals were pastured on unimproved land see, *Southern Cultivator*, 35 (January 1877), pp. 19-20 and *The Southern Cultivator and Dixie Farmer*, 41 (September 1883), p. 15.